

1402

THE
BRITISH PALLADIUM:

OR

Annual Miscellany of Literature and Science:

For the YEAR 1779.

THE THIRTY-FIRST NUMBER PUBLISHED.

In TWO PARTS.

The FIRST, containing NOTES, MEMORANDUMS,
OBSERVATIONS, and TABLES, for the YEAR:

With interesting SUBJECTS annexed, viz.

The Principles and Rudiments of GEOGRAPHY conti-
nued; or, a Natural, Topographical, and Historical,
ACCOUNT of our Terraqueous GLOBE.

The SECOND, comprehending ANSWERS to *Queries* and
Enquiries in the former YEAR'S PALLADIUM:

With new *QUERIES* and *ENQUIRIES* (*Natural, Historical, Geogra-
phical, Classical, Poetical, Arithmetical, Analytical, Philosophical,
and Mathematical*) for the present YEAR.

*Designed for the general Improvement of BOTH SEXES.
Particularly useful in Schools and Academies, and in Navigation.*

BY THE PALLADIUM-AUTHOR.



The treach'rous GALLIA, Foe to Britain's Isle,
Inur'd to *fraudful Arts*, and known for *Guile*!
Not fix'd by solemn *Leagues*, no Faith can sway,
But *British Fleets* and *Armies* must obey. ANTIGALLICAN.

LONDON: Printed for J. B E W, in Pater-Noster-Row. 1778.
Price One Shilling and Sixpence.

GEOGRAPHICAL TABLE.

SHewing the PROPORTION of the SURFACE of the *whole GLOBE*, compared with the *Surfaces of Seas and unknown Parts*, and with the *Surfaces of the inhabited World*, its four *Quarters*, different *Empires*, and 66 of the most considerable *Islands*.

The Whole and principal Parts.	Square Miles.	Islands.	Square Miles.	Islands.	S. M.
The Globe — —	199,512,595	Cuba —	38,400	St. Michael —	920
Seas & unknown Parts	160,522,026	Java —	38,250	Skye — —	900
The habitable World	38,990,569	Hispaniola	36,000	Lewis — —	880
Europe — — —	4,456,065	Newfoundld	35,500	Funen — —	768
Asia — — —	10,768,823	Ceylon —	27,730	Yvica — —	625
Africa — — —	9,654,807	Ireland —	27,457	Minorca —	520
America — — —	14,110,874	Formosa —	17,000	Rhodes — —	480
Perfian Empire, under Darius — }	1,650,000	Arian —	11,900	Cephalonia —	420
Roman Empire, at its greatest Height }	1,610,000	Gilolo —	10,400	Amboyna —	400
Ruffian Empire —	3,303,485	Sicily —	9,400	Orkney Pomona	320
Chinese Empire —	1,749,000	Timor —	7,800	Scio — —	300
Great Mogul Empire	1,116,000	Sardinia —	6,600	Martinico —	260
Turkish Empire —	960,057	Cyprus —	6,300	Lemnos — —	220
Present Perfian Empire	800,000	Jamaica —	6,000	Corfu — —	194
		Flores —	6,000	Providence —	168
		Ceram —	5,400	Man — —	160
		Briton —	4,000	Bornholm —	160
		Socatra —	3,600	Wight — —	150
		Candia —	3,220	Malta — —	150
		Port Rico —	3,200	Barbadoes —	140
		Corfica —	2,520	Zant — —	120
		Zeland —	1,935	Antigua — —	100
		Majorca —	1,400	St. Christopher's	80
		St. Jago —	1,400	St. Helena —	80
		Negropont —	1,300	Guernsey —	50
		Teneriff —	1,272	Jersey — —	43
		Gotland —	1,000	Bermudas —	40
		Madeira —	950	Rhode — —	36

ISLANDS.

Borneo — — —	228,000
Madagascar — —	168,000
Sumatra — — —	129,000
Japan — — —	118,000
Great-Britain — —	72,926
Celebes — — —	68,400
Manilla — — —	58,500
Iceland — — —	46,000
Terra del Fuego —	42,075
Mindinao — — —	39,200

INHABITANTS, at a Medium-Computation, contained in the known World.

In Europe - 153	} Millions.
Asia - - 500	
Africa - 150	
America - 150	
<hr/>	
Total 953 Mil-	
lions contained on the	
whole Globe.	

WINDS explained. — The Globe, whereon we inhabit, is every where encompassed by a thin invifible Fluid, called *Air*, extending its Body 45 Miles or upwards above the Earth's Surface. By Experiment, a *small Quantity* of this Air may be expanded into a very large *Space*, or may be compressed into a much smaller *Space* than it occupied before. The Air, thus expanded by Heat, and compressed by Cold, when any Part of it, or Part of our Atmosphere, is affected by more Heat and Cold than before, will thereby be put in Motion, and be expanded by Heat, or compressed by Cold. This Motion, or Current of Air, is called *Wind*, and is a *Breeze*, *Gale*, or *Storm*, according to the *less* or *greater* Swiftnefs of its Motion. *Winds*, therefore, are confidered exceedingly variable, as depending on Heat or Cold, their uncertain, variable, and general, Cause; and act with more or less Force and Irregularity, according as this Cause is more or less affecting, or constant, to the Air.

(Continued, see P. 13.)

A NEW GUIDE to the YEAR 1779.

P A R T I.

To find the Day of the Month from the Day of the Week, and the Day of the Week from the Month-Day.

Against each Month of the Year, to the Right-hand, stand the Seven Week-Days, above which stand all the Month-Days in that Month, answering to each Week-Day.

Contrarily. Under any Month-Day stands the Week-Day against that Month, at the Angle of Meeting.

Against each Month of the Year, to the Right-hand, stand the Seven Week-Days, above which stand all the Month-Days in that Month, answering to each Week-Day.			MONTH-DAYS and WEEK-DAYS.						
Contrarily. Under any Month-Day stands the Week-Day against that Month, at the Angle of Meeting.			1	2	3	4	5	6	7
			8	9	10	11	12	13	14
			15	16	17	18	19	20	21
			22	23	24	25	26	27	28
			29	30	31				
MONTHS of the YEAR.			Fr	Sa	Su	Mo	Tu	We	Th
January.		October.	Mo	Tu	We	Th	Fr	Sa	Su
February.		March.	Th	Fr	Sa	Su	Mo	Tu	We
April.		July.	Sa	Su	Mo	Tu	We	Th	Fr
		May.	Tu	We	Th	Fr	Sa	Su	Mo
		June.	Su	Mo	Tu	We	Th	Fr	Sa
		August.	We	Th	Fr	Sa	Su	Mo	Tu
September.		December.							

For Construction of the above Table, see P. 2, Palladium, 1763.

EXAMPLE I. To find the Day of the Month answering to the second Wednesday in May, 1779.

To the Right-hand of June you find Wednesday; directly above which, in the Columns among the Month-Days, stand 2, 9, 16, 23, 30, answering to all the Wednesdays in June: Therefore the second Wednesday is the 9th Day of June, required. So for other like Cases.

EXAMPLE II. To find the Day of the Week on which the Sun's Eclipse happens, 13th of June, 1779.

Under 13, the Month-Day, against June, at the Angle where the upper and Side Columns meet, stands Su, or Sunday, required.

NOTES for 1779.	Moveable FEASTS.	SUN rises.				
Dom. Let. N.S. C	Jan. 31. Septuages.	Mths.	1st	11th	21st	Examples.
--- O. S. F	Feb. 14. Shrove Su.					
Golden Number 13	17. Ash-Wed.	h m	h m	h m	h m	Against May
Epaet (or D's Age at	21. 1 Sun. Lent	Jan. 8 57	58 7	45		the Sun rises
Year's Beginning) 12	Apr. 4. East. Sund.	Feb. 7 22	7 6	36		d h m
Sun's Cycle 21	May 9. Rog. Sund.	Mar. 6 32	6 12	52		1 4 35
Roman Indiction 12	13. Ascension	April 5 31	5 11	4 53		11 4 20
Era Jul. Pe. Ja. 6492	23. Whitsunday	May 4 35	4 20	4 4		21 4 4
-Olympads Jul. 2555	30. Trin Sund.	June 3 51	3 45	3 43		Differ. 15 ^m
-Found. Ro. Ap. 2532	Nov. 30. St. Andrew.	July 3 46	3 54	4 4		in 10 Days
-Nabonassar Fe. 2526	Ember-Days.	Aug. 4 20	4 36	4 54		nearly; being
-Hegira July 1158	We. Fr. Sat.	Sep. 5 15	5 32	5 54		1½ Minute a
Greg. Era O.E. 197	Feb. 24, 26, 27.	Oct. 6 13	6 33	6 33		Day.
Yrs completed at the	May 26, 28, 29.	Nov. 7 12	7 30	7 45		N. B. Sun-
Mths, O.S. Olymp.	Sept. 15, 17, 18.	Dec. 7 58	8 6	8 8		rising sub.
Yrs more than by de	Dec. 15, 17, 18.					from 12 ^h
la Land*. See Axioms						gives Sun-
and Rules, p. 351.						Setting.
Roy. Astron.	*The Rest the same with his Cor ⁿ in Con. des Tems.					

N. B. The complete Years of the several Eras end at the Month, when the current Year takes Place,

Astronomical MOONS for Greenwich Observatory. 1779.

Full Moon.			Last Quarter.			New Moon.			First Quarter.		
Mths.	d.	h. m.	d.	h. m.	d.	h. m.	d.	h. m.	d.	h. m.	
Jan.	2	4 12 A	9	0 35 A	17	5 39 A	25	11 26 M			
Feb.	1	3 4 M	8	6 36 M	16	11 37 M	23	9 4 A			
Mar.	2	2 11 A	10	2 41 M	18	2 51 M	25	4 32 M			
Apr.	1	2 2 M	8	10 51 A	16	3 15 A	23	10 41 M			
	30	2 52 A									
May	30	4 51 M	8	5 9 A	16	1 7 M	22	4 37 A			
June	28	7 45 A	7	8 42 M	14	7 0 M	20	11 40 A			
July	28	11 1 M	9	9 17 A	13	3 56 A	20	9 7 M			
Aug.	27	2 5 M	5	7 30 M	11	10 52 A	18	10 1 A			
Sep.	25	4 52 A	3	3 50 A	10	6 55 M	17	2 31 A			
Oct.	25	6 51 M	2	2 58 A	9	5 14 A	17	9 51 M			
Nov.	23	7 58 A	1	5 48 M	8	6 25 M	16	6 34 M			
			30	1 15 A							
Dec.	23	7 53 M	29	10 36 A	7	10 32 A	16	2 53 M			

Add to the Month-Day for the Moon's Age.		Sun's same as Moon's Place, at New Moon.		Sun enters Signs.		Sub. and add from and to D's Southing for her Rising & Setting		To find the Tides at London.	
No.	d.	s.	d.	s.	d.	D's Place.	Arc & ±	Rule.	
Jan.	13	17	9 27	10	20	3 0	8 30	to the Time of D's Southing (from the Table of her South- ing) for the Time of H. Water required.	
Feb.	1	16	10 28	11	18	4 2	8 15	Ex. May 15, 1779- the D Souths by the Table following:	
March	12	18	11 28	0	20	5 1	7 15	15 ^d 11 ^h 33 ^m M.	
April	13	16	0 26	1	20	6 0	6 15	Add 2 30	
May	14	16	1 25	2	21	7 11	5 15	H W. 16 ^d 2 ^h 3 ^m A	
June	14	14	2 23	3	21	8 10	4 15	Add 5 30	
July	16	13	3 21	4	23	9 0	4 0	L. W. 16 ^d 7 ^h 33 ^m A.	
Aug.	15	11	4 19	5	23	9 20	4 15	at London-Bridge.	
Sept.	20	10	5 18	6	23	10 9	5 15	N. B. Time of High and Low Water, at Lond. serves for Boats bound down and up the River, or from above and below Bridge, to London, respectively.	
Oct.	20	9	6 16	7	23	0 0	6 15	Gen. Rule. Add the Time of H. Water, at New and Full D, for any Place, according to a Tide-Table, for the Time of the Moon's Southing that Day, for the Time of High-Water at that Place.	
Nov.	22	8	7 15	8	22	0 29	7 15		
Dec.	22	7	8 16	9	21	1 28	8 15		

* Making D 1st older at New; though N. D in Feb. is 15^d 23^h 36^m; viz. 16^d. Here Mr. Maskelyne differs 2^d from Truth in D's Age; and always d.f. 1^d.
 § This Computation cannot be nearer, except D's Age was given to Hours.

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N. B. The Festival marked * is preceded by a Vigil or Fast. If any of the Fast-Days fall on a Monday, the Vigil or Fast-Day must be kept on the Saturday before, and not on the Sunday, which is the greatest of Festivals.

The Days having this Mark † against them are Holidays observed at the Exchequer, Stamp-Office, Excise-Office, Custom-House, Bank, East-India and South-Sea Houses.

At the Custom-House there is no Holiday on Valentine, St. David, Shrove-Tuesday, Easter-Wednesday, St. Swithin, Lammas-Day, Fire of London, and Holy-Rood.

* * The Offices are mentioned 'all but such and such' after †, where no Holidays are kept, when they are kept in other Offices.

MEMORANDUMS for the YEAR 1779.

JANUARY, XXXI DAYS.

- 1 Circumcision. †
- 3 2d Sunday after Christmas.
- 4 Sir Isaac Newton b. 1643, N.S.
- 6 Epiphany, or Twelfth Day. †
- 8 Lucian.
- 10 1 Sunday after Epiphany.
- 13 Hilary Camb. Term begins.
- 14 Oxford Term begins.
- 15 Exchequer opened.
- 17 2d Sunday after Epiphany.
Old Twelfth Day.
- 18 Queen Charlotte's Birth-Day,
kept. † Prisca.
- 20 Fabian. 1 Return.
- 21 Agnes.
- 22 Vincent.
- 23 Hilary Term begins.
- 24 3d Sunday after Epiphany.
- 25 Conversion of St. Paul. †
- 27 Pr. Augustus Frederick b. 1773.
- 28 2 Return.
- 30 Ch. I. beheaded, 1648-9, O.S.
12^m past One. †
- 31 Septuagesima Sunday.

FEBRUARY XXVIII DAYS.

- 2 Purification of the V. M. *
- 3 Bishop Blaize. 3 Return.
- 5 Agatha.
- 7 Sexagesima Sunday.
- 9 4 Return.
- 10 Dies Scholastica at Oxford.
- 12 Hilary Term ends.
- 13 Old Candlemas-Day.
- 14 Quinquagesima Sunday. Valen-
tine. † All but the Stamp,
Custom, and South-Sea Houses.
- 17 Ash-Wednesday. Camb. Term
divides M.
- 21 1st Sunday in Lent.
- 24 St. Matthias, * † Pr. Adolphus
Frederick b. 24, 26, and 27,
Ember Days.

28 2d Sunday in Lent.

Hare Hunting goes out.

MARCH XXXI DAYS.

- 1 St. David. Anniversary Meet-
ing of the Welch Society, who
wear a Leek on this Day, in
Memory of a famous Victory
over the Saxons. † All but the
Stamp, and Custom-House.
- 2 Chad, Bishop.
- 5 Princess of Hesse born.
- 7 3d Sunday in Lent.
Perpet. Maurit. Mart.
- 12 Gregory Mart.
- 14 4th Sunday in Lent. Midlent-Su.
- 17 St. Patrick, Bp. of Ireland.
- 18 Edward, K. of the W. Saxons.
Cambridge latter Act, Thursday
after 4th Sunday in Lent.
- 19 Joseph. Prs Louisa Ann, born.
- 21 5th Sunday in Lent. St. Benedict.
- 25 Annunciation of the V. M.
LADY-DAY, 1st Quarter-D. †
- 26 Cambridge Term ends.
- 27 Oxford Term ends.
- 28 6th Sunday in Lent. Palm-Sund.
- 31 Sir Is. Newton died 1727, N.S.
a Miracle of the Age.

APRIL XXX DAYS.

- 1 All Fools Day. Maundy Thurs-
day.
- 2 Good Friday.
- 3 Richard, Bishop of Chichester.
- 4 EASTER SUNDAY. St Ambrose.
- 5 Easter Monday. † Old Lady-D.
- 6 Easter Tuesday. †
- 7 Easter Wednesday. †
- 11 1st Sund. after Easter. Low-Su.
- 14 Oxford and Camb. Terms begin.
Wednesday after Low-Sunday.
- 18 2d Sunday after Easter.
- 19 Alphege. 1 Return.
- 21 Term begins.

23 St.

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- 23 St. George. †
 25 3d Sunday after Easter. St. Mark.
 26 2 Return.
 27 Victory of Culloden.
 MAY XXXI DAYS.
 1 St. Philip and St. James. * †
 2 4th Sunday after Easter.
 3 Invent. of the Cross. 3 Return.
 6 St. John ante Port. Lat.
 9 5th Sunday after Easter. Rega-
 tion Sunday.
 10 4 Return.
 12 Old May Day.
 13 Ascension-Day. * Holy Thurs.
 14 5 Return.
 16 Sunday after Ascension-Day.
 17 Easter Term ends.
 19 Queen Charlotte born, 1744. †
 St. Dunstan.
 22 Princess Elizabeth born, 1770.
 23 Whit Sunday. *
 24 Whit Monday. †
 25 Whit Tuesday. †
 26 St. Augustin, 1st Abp. of Can-
 terbury. No Night.
 26, 28, and 29, Ember Days.
 27 Venerable Bede.
 29 K. Charles II.'s Nat. and Resto-
 ration after 12 Years Exile.
 30 Trinity Sunday.
 31 1 Return. Camb. T. divides M.
 JUNE XXX DAYS.
 1 Nicomedes.
 2 Oxford and Camb. Terms begin.
 4 K. George III. born, 1738. *
 Term begins.
 5 Prince Ernest Augustus born,
 1771. Boniface.
 6 1st Sunday after Trinity.
 7 2 Return.
 10 Princess Amelia born, 1711. †
 All but Excheq. and Custom-
 House.
 11 St. Barnabas. † *
 13 2d Sunday after Trinity.
 14 3 Return.
 17 St. Alban.
 20 3d Sunday after Trinity.
 Transl. Edw. K. W. Saxons.
 21 4 Return.
 22 Longest Day.
 24 St. JOHN BAPTIST. † 2d Quar-
 ter Day.
 27 4th Sunday after Trinity.
 29 St. Peter and Paul. * †

- 30 Buck-Hunting comes in, and
 continues till Holy-Rood. Ex-
 eter and Wadham College E-
 lection, at Oxford.
 JULY XXXI DAYS.
 1 Oxford Aft, Thurs. after 4th
 Sunday after Trinity.
 2 Visitation of B. V. Mary. Ox-
 ford and Camb. Terms begin.
 4 5th Sunday after Trinity.
 Translation of St. Martin, Bp.
 5 Old Midsummer Day.
 Dies Comitiorum.
 6 Cambridge Commencement, for
 B. A. 1st Tuesday in July.
 Tho. à Becket, Church Tyrant.
 9 Camb. Term ends.
 11 6th Sunday after Trinity.
 No Night.
 12 Oxford Aft.
 15 St. Swithin. † All but Stamp,
 Custom and South-Sea Houses.
 17 Oxford Term ends.
 18 7th Sunday after Trinity.
 20 Margaret, Virgin and Martyr.
 Mary Magdalen.
 24 Magdalen-College Election.
 25 8th Sunday after Trinity.
 St. James. * †
 26 St. Anne, Mother B. V. Mary.
 27 Portsm. Dock fired at 4 o'Clock
 in the Morning, 1770.
 30 Dog-Days begin.
 Canicula rises with the Sun.
 AUGUST XXXI DAYS.
 1 9th Sunday after Trinity.
 Lammas Day.
 4 Crown-Point taken by General
 (now Lord) Amherst, 1759.
 6 Transfiguration of Christ.
 7 Name of Jesus.
 8 10th Sunday after Trinity.
 10 St. Lawrence.
 11 Prs. of Brunswick b. 1717. † All
 but Cust. and S. Sea Houses.
 12 Prince of Wales born, 1762. †
 15 11th Sunday after Trinity.
 Assumption.
 16 Pr. Fred. Bp. of Osnab. b. 1763.
 21 Athanasius. Pr. William Hen-
 ry born, 1765.
 22 12th Sunday after Trinity.
 24 St. Bartholomew. * †
 28 St. Augustin.
 29 13th Sunday after Trinity.
 29 Beheading

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- 29 Beheading of St. John Baptist.*
- 30 Sun and Clocks together.

SEPTEMBER XXX DAYS.

- 1 St. Giles.
- 2 London burnt, 1666, O. S.
- 5 14th Sunday after Trinity.
- 7 Eunuchus.
- 8 Nativity of the B. V. Mary.
- 9 Dog-D. end. Canis Major rises with the Sun, at 3 in the Morn.
- 12 15th Sunday after Trinity.
- 14 Holy Cross Day.† All but the Stamp, Custom and S. Sea H.
- 15, 17, and 18, Ember Days.
- 17 Lambert, Bp.
- 18 City of Quebec surrendered to Gen. Townshend, (now Lord Townshend,) 1759. King Geo. I. and II. landed.† All but the Custom-House.
- 19 16th Sunday after Trinity.
- 21 St. Matthew.*†
- 22 K. George III. and Q. Charlotte crowned, 1761.† All but the Custom - House. Equal Day and Night in all the World.
- 26 17th Sunday after Trinity. St. Cyprian.
- 28 Sheriffs of London sworn.
- 29 St. MICHAEL. Third Quarter-Day.† Hare-hunting comes in, and lasts till the End of Feb. Princess Charlotta Augusta b. 1766.

- 30 St. Jerome.

OCTOBER XXXI DAYS.

- 1 Remigius, Bp. of Rhemes.
- 3 18th Sunday after Trinity.
- 6 St. Faith.
- 9 St. Dennis.
- 10 19th Sunday after Trinity. Old Michaelmas-Day. Oxford and Cambridge Terms begin.
- 13 Transl. of K. Edward, Confessor.
- 17 20th Sunday after Trinity. Ethelred.
- 18 St. Luke.
- 19 St. Friedswide, a Fest. at Court.
- 24 21st Sunday after Trinity. K. George III.'s Accession. Crispin.
- 26 K. Geo. III. proclaimed, 1760.
- 28 St. Simon and Jude.*

- 31 22d Sunday after Trinity.

NOVEMBER XXX DAYS.

- 1 All Saints.†*

- 2 All Souls. Pr. Edward born, 1768. All but Stamp, Custom and South-Sea Houses.

- 3 1 Return.

- 4 King William born.

- 5 Gunpowder-Treason, 1605.†

- 6 Leonard. Mich. Term begins.

- 7 23d Sunday after Trinity.

- D. Cumberland born, 1745.

- 8 Prs. Augusta Sophia, b. 1768.

- 9 Lord-Mayor's Day, at London.† All but the Exchequer.

- 11 St. Martin.

- 12 2 Return. Camb. T. divides M.

- 13 Britius, Bishop.

- 14 24th Sunday after Trinity.

- 15 Machutus.

- 17 Hugh, Bp. Lincoln. Anniv. of Q. Elizabeth's Proc.† All but the Cust. and S. Sea Houses.

- 18 3 Return.

- 20 Edmund, King and Martyr.

- 21 25th Sunday after Trinity.

- 22 Cecilia. Old Martinmas-Day.

- 23 St. Clement.

- 25 D. of Gloucester born, 1743.

- St. Catharine. 4 Return.

- Baliol-College Elect. Thursday before St. Andrew.

- 28 Advent Sunday.

- Michaelmas Term ends.

- 30 St. Andrew.*

DECEMBER XXXI DAYS.

- 4 Barbary.

- 5 2d Sunday in Advent.

- 6 Nicolas.

- 7 Portsmouth-Dock fired by John the Painter, 1776.

- 8 Conception of the B. V. Mary.

- 12 3d Sunday in Advent.

- 13 Lucy.

- 15, 17, and 18, Ember Days.

- 16 O Sapientia. Camb. Term ends.

- 17 Oxford Term ends.

- 19 4th Sunday in Advent.

- 21 St. Thomas.

- 25 CHRISTMAS-DAY.* 4th Quat.

- Day. Fox-Hunting comes in,

- and lasts till Lady-Day.

- Sun and Clocks together.

- 26 1st Sunday after Christmas.

- St. Stephen.

- 27 St. John the Evangelist.†

- 28 Holy Innocents.

- 31 Sylvester, Bishop of Rome.

A TABLE

A TABLE of the MOON'S Southing, or Times when she passes the Meridian of Greenwich-Observatory, for the Year 1779.
For the Use of Seamen and Others to find the Time of Tides, &c.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
D	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
1	11 17	Morn.	11 36	om 3	om 21	1 m 29	1 m 48	2 m 44	3 m 42	4 m 26	6 m 28	6 m 56
2	Morn.	0 56	Morn.	0 49	1 10	2 19	2 35	3 26	4 32	5 25	7 21	7 43
3	0 22	1 50	0 28	1 36	1 57	3 9	3 21	4 9	5 25	6 25	8 14	8 29
4	1 25	2 41	1 18	2 22	2 47	3 57	4 4	4 53	6 21	7 26	9 4	9 15
5	2 26	3 28	2 5	3 10	3 37	4 44	4 47	5 40	7 23	8 26	9 53	10 1
6	3 21	4 13	2 51	3 59	4 26	5 29	5 29	6 31	8 25	9 24	10 38	11 46
7	4 11	4 57	3 37	4 49	5 16	6 13	6 14	7 26	9 28	10 16	11 25	11 37
8	4 58	5 42	4 23	5 39	6 5	6 56	7 0	8 26	10 28	11 7	0 a 28	0 a 28
9	5 43	6 27	5 11	6 29	6 52	7 40	7 49	9 30	11 26	11 56	1 3	1 20
10	6 26	7 14	5 59	7 19	7 37	8 26	8 42	10 35	0 a 19	0 a 44	1 54	2 12
11	7 8	8 2	6 49	8 7	8 21	9 15	9 41	11 38	1 10	1 32	2 46	3 1
12	7 52	8 52	7 39	8 54	9 7	10 8	10 44	0 a 0	1 58	2 21	3 37	3 48
13	8 36	9 42	8 29	9 40	9 53	11 5	11 51	1 35	2 46	3 11	4 28	4 33
14	9 24	10 32	9 19	10 26	10 41	0 a 8	0 a 57	2 26	3 34	4 2	5 17	5 16
15	10 12	11 20	10 7	11 12	11 33	1 13	1 58	3 14	4 23	5 54	6 3	5 57
16	11 1	0 a 8	10 54	11 59	0 a 27	2 18	2 54	4 1	5 13	5 45	6 48	6 38
17	11 51	0 54	11 40	0 a 49	1 28	3 20	3 46	4 47	6 3	6 35	7 31	7 19
18	0 a 40	1 39	0 a 25	1 42	2 31	4 17	4 34	5 34	6 54	7 23	8 13	8 3
19	1 27	2 23	1 11	2 38	3 35	5 9	5 20	6 22	7 45	8 10	8 56	8 50
20	2 13	3 9	1 59	3 38	4 36	5 58	6 5	7 11	8 34	8 55	9 39	9 41
21	2 58	3 56	2 48	4 40	5 34	6 44	6 50	8 1	9 22	9 38	10 26	10 37
22	3 42	4 45	3 41	5 41	6 28	7 28	7 36	8 52	10 8	10 22	11 15	11 39
23	4 26	5 38	4 37	6 40	7 18	8 12	8 24	9 42	10 53	11 5	Morn.	Morn.
24	5 12	6 35	5 37	7 36	8 5	8 56	9 13	10 31	11 37	11 50	0 9	0 44
25	5 59	7 36	6 38	8 29	8 49	9 42	10 3	11 18	Morn.	Morn.	1 8	1 48
26	6 51	8 38	7 39	9 18	9 34	10 30	10 53	Morn.	0 20	0 39	2 11	2 50
27	7 46	9 41	8 38	10 5	10 19	11 19	11 42	0 4	1 4	1 30	3 14	3 47
28	8 46	10 41	9 33	10 50	11 4	Morn.	Morn.	0 48	2 49	2 25	4 15	4 40
29	9 49		10 26	11 36	11 50	0 10	0 30	1 30	2 38	3 24	5 13	5 29
30	10 54		11 16	Morn.	Morn.	1 0	1 16	2 14	3 30	4 24	6 6	6 15
31	11 57		Morn.		0 39		2 1	2 57		5 27		7 0

To find the Time of H. Water on any Day of the Month, at any given Place, for 1779.

Gen. Rule. To the Time of the Moon's Southing, (from the above Table,) for that Day, add the Time of H. W. at N. or F. Moon at the given Place, (from Tide-Table, p. 105, 106, Pal. 1765, or any other Tide-Table,) and the Sum, abating 12, when above 12 Hours, will be the Time of High-Water.

Example. To find the Time of High-Water, at London, on April 1, 1779. h m
From the above Table, the Moon souths at London, on that Day, April 1, om 3
To which add the constant Time of H. Water at N. and F. Moon, at London, 2 30

Time of High-Water, April 1, at London, in the Morning, — — — — 2 m 33

Add, for next Low-Water, — — — — — 5 48

Low-Water, at London, on April 1, 1779, in the Morning, — — — — 8 m 21

* * Seamen may also determine the Time of H. W. at any Place, from the Moon's Age, and a Tide-Table; but not so near as by the above Method, and have the Time of H. W. at N. and F. observed at each Place; allowing for the Violence of Winds causing some Alteration in the Times of Tides.

☞ The above Table of the Moon's Southing is also of special Use for finding the Moon's near Time of Rising and Setting, at any Place, or Part of the Globe, from her mean (or true) Place, and semi-diurnal Arch corresponding.

PALLADIUM-AUTHOR.

A TABLE

ANNUAL MICELLANY, 1770.

o

A TABLE of the Eclipses of the first SATELLITE of JUPITER, for Gr. Obs. 1779.
For finding the Difference of Longitude, by Sea or Land.

January.			February.			March.			April.			May.			June.		
Immerfi.			Immerfi.			Immerfi.			Emerfion			Emerfion.			Emerfion.		
D	h	m s	D	h	m s	D	h	m s	D	h	m s	D	h	m s	D	h	m s
1	1	6 53	2	21	27 57	2	5	5 18	1	9	32 2	1	11	45 50	2	8	20 50
2	19	34 21	3	15	56 16	3	23	34 15	3	4	1 12	3	6	14 39	4	2	49 15
4	14	2 0	5	10	24 36	5	18	3 9	4	22	30 18	5	0	43 31	5	21	17 40
6	8	29 37	7	4	52 55	7	12	52 6	6	16	59 27	6	19	12 17	7	15	45 56
8	2	57 14	8	23	21 19	9	7	1 8	8	11	28 35	8	13	41 3	10	14	14
9	21	24 54	10	17	49 44	11	1	30 12	10	5	57 42	10	8	9 50	11	4	42 30
11	15	52 35	12	12	18 13	Emerfions			12	0	26 45	12	2	38 31	12	23	10 51
13	10	20 23	14	6	46 4	12	22	11 54	13	18	55 49	13	21	7 14	13	17	39 5
15	4	48 3	16	1	15 20	14	16	40 57	15	13	24 51	15	15	35 52	16	12	7 22
16	23	15 51	17	19	43 54	16	11	10 1	17	7	53 59	17	10	4 29	18	6	35 37
18	17	43 40	19	14	12 35	18	5	9 7	19	2	22 57	19	4	33 4	20	1	3 54
20	12	11 33	21	8	41 14	20	0	8 7	20	20	52 2	20	23	1 39	21	19	32 7
22	6	32 29	23	3	10 2	21	18	37 20	22	15	21 3	22	17	30 10	23	14	0 26
24	1	7 28	24	21	38 46	23	13	6 23	24	9	50 3	24	11	58 40	25	8	28 45
25	19	35 31	26	16	7 37	25	7	35 32	26	4	18 57	26	6	27 8	27	2	56 57
27	14	3 32	28	10	36 17	27	2	4 37	27	22	47 54	28	0	55 37	28	21	25 10
29	8	31 39				28	20	33 49	29	17	16 53	29	19	22 57	30	15	53 27
31	2	59 45				30	15	2 51				31	13	52 29			
July.			August			September			October.			November			December		
Emerfion.			Emerfion.														
D	h	m s	D	h	m s	The Eclipses of all Jupiter's 4 Satellites will be invisible this Month, on Account of Jupiter's Nearness to the Sun. N.B. The Afterism, * over any Number, denotes that Eclip. is not visible at Greenw.			The Eclipses of all the 4 Satellites will be invisible this Month, on Account of Jupiter's Nearness to the Sun.			D	h	m s	D	h	m s
2	10	21 42	1	12	25 35							1	11	17 56	1	13	14 29
4	4	50 4	3	6	54 16							3	5	46 18	3	7	42 9
5	23	18 23	5	1	22 59							5	0	14 40	5	2	9 46
7	17	46 42	6	19	51 45							6	18	42 57	6	20	37 22
9	12	15 0	8	14	20 28							8	13	11 15	8	15	4 37
11	6	43 20	10	8	49 19							10	7	39 28	10	9	32 27
13	1	11 48	12	3	18 11							12	2	7 35	12	3	50 56
14	19	40 8	13	21	46 58							13	20	35 44	13	22	27 23
16	14	8 38	15	16	15 53							15	15	3 47	15	16	54 50
18	8	37 1	17	10	44 49							17	9	31 51	17	11	22 23
20	3	5 34	19	5	13 44							19	3	59 48	19	5	49 51
21	21	34 2	20	23	42 36							20	22	27 39	21	0	17 21
23	16	2 35	22	18	11 34							22	16	55 37	22	18	44 48
25	10	31 7	24	12	40 31							24	11	23 30	24	13	12 15
27	4	59 41	26	7	9 38							26	5	51 2	26	7	39 15
28	23	28 15										28	0	19 4	28	2	7 8
30	17	56 55										29	18	46 48	29	20	34 38
												31	15	2 11			

To find the Difference of Longitude from Greenwich-Observatory.

Rule. The Difference of Time between any Eclipse of Jupiter's first Satellite at Greenwich, happening as above, and the Time the same Eclipse is observed to happen, at any Place, by Sea, under a distant Meridian, being turned into Degrees, will be the Difference of Longitude between Greenwich and the Place of Observation.

Example. Eclipse of the first Satellite of Jupiter, at Greenw. April 15 13 24 51
The same Eclipse observed at Sea, or a distant Port, sooner — — — 15 4 16 40

Multiply h. m. s. in Time (viz. 9^h 8^m 11^s) by 15 for D. M. S. }
Diff. Long. Hence the Difference of Longitude to the West of Greenwich, is 137° 2^m 45^s; req. Diff. Long. Westerly. } 9 8 11

N. B. The sooner Time, in Respect of the Time at Greenwich or first Place, is West, and the later Time East, Longitude from Greenwich.

SIX ECLIPSES in the YEAR 1779.

Carefully computed from the Durham-Tables, for Greenwich.—By Mr. Michael Wood, at Christopher Buckle's, Esq. at Banstead, in Surry, May 1, 1778. Compared with the Times and Circumstances in the Nautical Ephemeris.

I. Of the SUN, invisible, on Sunday, May 16. at 1^h 2^m Morn. equal Time at Greenwich. M. Wood.

Ecliptic Opposi. Sun's Pl.	1	24	56	30	1 ^h 6 ^m Morning.
Moon in the Ecliptic	1	24	56	30	1 ^s 24 ^o 56' 30" Nautical Ephemeris.
Moon's Lat. South Asc.	1	29	12		1 ^o 29' 30" S. Nevil Maskelyne.
Sun's hourly Motion	—		2	24	} Michael Wood.
Sun's horizontal Diameter	—		31	35	
Moon's hourly Motion	—		36	26	
Moon's horizontal Parallax	—		61	1	
Moon's horizontal Diam.	—		32	44	

II. Of the MOON. Total, and partly visible at Greenwich, Sunday, May 30, in the Morning. M. Wood.

	h	m	s	h	m	
Beginning of the Eclipse	3	2	17	3	2	app. Time.
Morn. apparent Time.						
Moon sets	—	4	4	0		} N. Maskelyne.
Digits eclipsed at Setting	10 ^d	33'	0"			
	h	m	s	h	m	
Beginning of total Darknefs	4	12	27	4	13	} Nautical Ephemeris.
Middle	4	54	33	4	55	
End of the total Darknefs	5	56	39	5	37	
End of the Eclipse	6	46	49	6	48	
Digits at Middle	15 ^o	53'		15 ^o	47'	

Our Astronomer Royal gives no Latitude of the Moon in this total Eclipse, Mr. Wood gives the Sun's and Moon's Properties as follow.

Sun's Place	2	8	31	46	Moon's Lat. N. D.	15	27
Moon in the Ecliptic	2	8	31	46	Moon's hourly Motion	30	34
Sun's hourly Motion	—	2	24		Moon's horizontal Parallax	54	46
Sun's horizontal Diam.	—	31	32		Moon's horizontal Diam.	29	51

☞ Observe the Difference of Propriety and Accuracy in these Computations.

III. Of the SUN. Visible at Greenwich, Monday, June 14, in the Morning. M. Wood.

Beginning of the Eclipse -	h m s	h m	} <i>Nautical Ephemeris.</i>	} First Contact 16° from the Sun's Vertex Westerly.
Morning.	7 27 27	7 18		
Middle - - - - -	8 7 49	7 59		
End - - - - -	8 51 3	8 43	} No Lat. given of the Moon.	
Digits - - - - -	3° 0'	3° 15' N. Limb. <i>N. Maskelyne.</i>		
	s o ' "	° ' "		
Sun's Place - - - - -	2 23 2 14	D's Lat. N. Af. 1 4 30	} Properties given by M. Wood.	
Moon in the Ecliptic -	2 32 2 14	D's hour. Mot. 37 36		
Sun's hourly Motion -	2 23	D's hor. Par. - 61 8		
Sun's horizontal Diam.	31 29	D's hor. Diam. 32 22		

IV. Of

IV. Of the SUN. Invisible at *Greenwich*, Monday, November 8^d 6^h 7^m, equal Time, ecliptic Conjunction, Morn. M. WOOD.

Sun's Place	-	-	-	7	15	43	40	D's Lat. N. Af.	1	28	58	} Mr. Maskelyne makes no Eclipse hap. at this Time.
Moon's Place	-	-	-	7	15	43	40	D's hourly Mot.	33	1		
Sun's hourly Motion	-	-	-			2	27	D's hor. Diam.	31	3		
Sun's horizontal Diam.	-	-	-			31	54	Mich. Wood.				

V. Of the MOON. Total and visible at *Greenwich*, on Tuesday, November 23, Afternoon. M. WOOD.

Beginning	-	-	-	h	m	s	h	m	s	} Nautical Ephemeris, Nevil Maskelyne.
				6	8	22	6	7	30	
Beginning of tot. Darknes	-	-	-	7	7	26	7	7	0	
Middle of the Eclipse	-	-	-	7	57	31	5	57	30	
End of total Darknes	-	-	-	8	47	36	8	48	0	
End of the Ecliptic	-	-	-	9	46	40	9	47	30	
Digits eclipsed	-	-	-	20	52		20	42		} M. Wood.
Duration of tot. Darknes	1	h	4	m	10	s				
Total Duration	-	-	-	3	38	18				

M. Wood gives the following Properties, in which Mr. Maskelyne is silent.

Sun's Place	-	-	-	8	1	26	34	Moon's Latitude S. A.	-	-	3	59
Moon in the Eclipse	-	-	-	2	1	26	34	Moon's hourly Motion	-	-	35	33
Sun's hourly Motion	-	-	-			2	32	Moon's horizontal Parallax	-	-	59	14
Sun's horizontal Diam.	-	-	-			32	26	Moon's horizontal Diameter	-	-	32	19

Performed like a Workman, Pal. Auth. — As the Royal Astronomer neglects the Moon's Latitude, no Wonder he misses an Eclipse.

VI. Of the SUN. Invisible at *Greenwich*, Tuesday, December 7^d 10^h 23^m, Night-Time, ecliptic Opposition. M. WOOD.

				s	o	/	"	d	h	m		} <i>Nau. Exp. N. Maske- lyne.</i>
Sun's Place - - -	8	15	45	46				7	10	31, being 8 ^m Dif.		
Moon in the Ecliptic -	8	15	45	46				8 ^s	15°	46' 0"		
Moon's Lat. S. Aft. -			1	14	34			1	14	S.		
Moon's hourly Motion			31	12								
Moon's horizon Paral.			55	16				Sun's hourly Motion -	2	33		} <i>Mic. Wood</i>
Moon's hor. Diam. -			30	10				Sun's hor. Diam. - -	32	31		

** From the above Computations it is seen how deficient the principal and assistant Computers are in Calculations of the annual Eclipses.

REMARKS on the NAUTICAL EPHEMERIS. By OBSERVATOR.

THE Errata in *Nautical Ephemeris*, 1778, are seen to be no less than three Dozen of enormous and unpardonable Blunders, (of more Trouble than Utility to correct,) committed between the celebrated Author, his Auxiliaries, (who are paid their annual Salaries by Government,) and the very diligent and learned Printer. See the End of the Preface to the *Nautical Ephemeris*, 1779, for a Proof of the great Merit of the Conductor and Printer, who both read the Proof-Sheets of that celebrated Work.

By the Purchase of which *extraordinary Production*, performed by the *Scheballian Astronomer*, many Sea-Officers pay their Money to be *mised* in the Instances of three Dozen past and irrecoverable Blunders, before recited, instead of being furnished, *gratis*, with the Calculators *new Scheme*, till its *Utility* be ascertained to the Public. Whereas the past Errors committed, are seen to be of the utmost Consequence to the *Gentlemen* of the Navy, with Respect to the Shipping, the Lives, and Property, on-board.

If the accumulated Errors recited, and proved, in a *following Year's Ephemeris* to that wherein the Blunders were first committed, lie more with the Printer than with the *Compiler and Conductor* of the Work, certainly the *Culprit* deserves to be discharged from his Employ, as an Abuser of his Trust, and as one unfit for the Office he, so daringly, has assumed, and unworthily executed; by relying on the Abilities of his Assistants, appearing as incapable as himself, to execute the important Service.

The Danger of Errors carried to Sea, in one Year's *false Ephemeris*, cannot be prevented by a following Year's Correction, or future *Ephemeris*, no more than a Danger already incurred can be prevented by a future Caution.

In this *Nautical Ephemeris*, the Moon's Age, throughout the Year, is given one Day older than it is, by her Age being set down one Day at each *new Moon*, or Moon's Conjunction with the Sun; even when the *true* Conjunction does not happen till the Day following, near Noon, after the Noon when the *new Moon* is set down one Day old; making, at least, near two Days Difference from Truth. Witness the *new Moon*, set down to be one Day old, on the 15th of February, 1779, at Noon; though the real *new Moon*, at her Conjunction with the Sun, does not happen, according to the *Nautical Ephemeris*, till February 15^d 23^h 36^m; wanting only 24^m of the 16th Day of February, at Noon. Nevertheless, the said *Ephemeris* makes the Moon to be one Day old on the 15th of February, at Noon, to which Time all Computations, in that *Ephemeris*, are generally made. Hence, an Error of nearly two Days Difference from Truth, in the Moon's Age, is reckoned too much, it naturally follows, throughout that Lunation; the Difference of the *new Moon* from Truth, in this *Ephemeris*, being always one Day too much.

This Way of reckoning the Moon's Age, one Day old at *new Moon*, is similar to reckoning an *Infant* to be one Day old at its Birth. Though an *Infant*, entering into the first Year of its Age, at its Birth, is not one Year old, no more than every *new Moon* is one Day old, (according to *Nautical Ephemeris* in general,) though so set down in February, *Nautical Ephemeris*, 1779, almost one Day before the Moon's Conjunction with the Sun, or before the *new Moon* happens.

To put the *Scheballian Astronomer* into the right Road, with Respect to the Moon's Age, it is hereby ascertained and enacted, that, at every repeated Revolution of the Moon with the Sun, the Moon is continually one Day older than she was at the Completion of her former Revolution; whereby, in twenty-nine or thirty such complete Revolutions, she goes through all the Days of her Age, in twenty-nine or thirty of those Revolutions, respectively performed in that lunar Period.

Astronomical Quere. By OBSERVATOR.

WHETHER a Halley, during his whole Life-Time of Computation, ever committed such a Number of Blunders and Absurdities, as are to be seen among the Calculations for the Security of the Royal Navy, in the *Nautical Ephemeris*, 1778, detected by the Blunderers, (paid by the Government,) too late for public Utility, in the *Nautical Ephemeris*, 1779, at the End of that Preface.

WINDS

WINDS explained. Continued from P. 2.

Observation does discover that from thirty Degrees North Latitude, to as many Degrees South Latitude, there is a constant *Easterly Wind*, through the Year, directing its Course over the *Atlantic* and *Pacific Oceans*, which is called the *Trade-Wind*. It is occasioned by the Action of the Sun, moving from *East* to *West*, producing Heats, and expanding the Air, under him, as he moves, whereby a Stream, or Tide, of Air follows his Direction; occasioning a constant *Easterly Wind* within the said Limits. Which *general Cause*, however, is varied so as to produce a Number of complicated Effects, too tedious to explain in our small Compass; but may be ascertained by *Facts*, from Observation, far exceeding all *Theory*.

It is *observed*, that, in some Parts of the *Indian Ocean*, not above two hundred Leagues from Shore, there are *periodical Winds*, called *Monsoons*, blowing Half the Year in one Direction, and the other Half Year on the contrary. At the Change of these Winds, always happening at the *Equinoxes*, terrible Storms of Thunder and Lightening, Wind and Rain, attend. It is also observed, that, in the same Latitudes, there is another Sort of *periodical Winds*, blowing from Land in the Night and greatest Part of the Morning; and, from the Sea, about Midnight; which do not extend more than two or three Leagues from the Shore. Near the Coast of *Guinea*, in *Africa*, the Wind blows always from the *West South-West* or *South*. On the Coast of *Peru*, in *South America*, the Winds constantly blow from the *South-West*. And, beyond the Latitudes of thirty Degrees, *North* and *South*, the Winds, as they are daily found in *Great-Britain*, are *observed* to be more variable, though they blow oftener from the *West* than any other Point of the Compass. It is farther observed, that between the *fourth* and *tenth* Degrees of North Latitude, and between the Longitudes of *Cape de Verd*, and the *Eastermost* of the *Cape de Verd* Islands, there is a *Space of Sea*, attended with *perpetual Calms*, accompanied with terrible Thunder and Lightening, and such violent Rains, that this Tract of Sea has obtained the Name of *The Rains*.

PALLADIUM-AUTHOR.

[Tides to be explained hereafter.]

TOPOGRAPHICAL GEOGRAPHY, continued.

A S I A.

Position N. E. — Climate I. to XI.

Lat.	Long.	Length.	Breadth.	Sq. Miles.	Inhabitants.
3 to 30° N.	— 25° to 180° E.	— 4740 M.	— 4380	— 10,768,823	— 500,000,000.

Boundary.	{	Frozen	{	Oceans,	{	N.	{	Indian	{	Seas,	{	S.
		Pacific		E.		Mediterranean		W.				

Language. Arabic, Chinese, Greek, Japanese, Malayan, Persian, Russian, Tartarian, and Turkish.

A R A B I A, S. W. of Rome.

Lat.	Long.	Length.	Breadth.	No Inhabit.
12° to 30° N.	— 35° to 60° E.	— 1300	— 1200	— 700,000.

Boundary.

Boundary. } Turkey, N. Indian Ocean, S. } Distance from London, 2640
 } Bufforah Gulph, E. Red Sea, W. } Miles, S. E.

Arabia	<i>Divisions</i> 3.	<i>Cb. Towns.</i>	<i>Seas</i> , 2. Eastern Sea, S.E. Red, S.W.
	Petrea, N. W.	Suez,	<i>Gulphs</i> , 2. Persian, N.E. Ormus, N.E.
	Deserta, Mid.	Mecca,	<i>Lakes</i> , 2. Rosalgate, E. Musledon, S.E.
	Felix, S. E.	Mocho.	<i>Mountains</i> , 4. Gabel el Ared, Middle, Horeb, Sinai, N. W.
			<i>River</i> , 1. <i>Rise. Course. Fall.</i> Euphrates, Ararat, S.E. Persi, Gulph.

CHINA, Empire, S. E. from Rome.

Lat. Long. Length. Breadth. Sq. Miles. N^o Inhabit.
 20° to 42° N.—98° to 123° E.—1440.—1260.—1,749,000.—50,000,000

Boundary. } Tartary, N. Chinese Ocean, S. } *Climate* VI.—*Cb. Town.* Pekin.
 } Pacific, E. Tonquin, W. } *Dist. from Lond.* 4320 M. S.E.
 Inhabitants, 2,300,000.

Annals, 1840, 2, 300, 000.

DIVISIONS V.

	<i>Subdivisions.</i>	<i>Ch. Towns.</i>		<i>Subdivisions.</i>	<i>Ch. Towns.</i>
Northern 6.	Peking,	Peking.	Mid. 3.	Kiansi,	Nanchang.
	Leatung,	Leaoching.		Honam,	Cailung.
	Chantang,	Cynan.		Huquam,	Vuchang.
	Chanfi,	Taquen.	West 3.	Suchuen,	Chingtu.
	Chenfi,	Sigam.		Queicheu,	Queyang.
	Chekkiang,	Hanchen.		Junnan,	Junnan.
	China, Tartary, E.		Chynian.		
Southern 7.	Nanking,	Nanking,	<i>Seas</i> , 3. Yellow, Corea, N. Chinese, S. E.		
	Fokien,	Focheu,			
	Quansi,	Quellein.	<i>Bays</i> , 2. Nanking, Canton, S.		
	Canton,	Canton.	<i>Lakes</i> , 2. Piex, Tay, E.		
	Formosa,	Tambay.	<i>Mountains</i> , 2. Ottoröcoran, N. Da-		
	Ainan,	Lincato.	masian, W.		
	Macao,	Macao.	<i>Course. Fall.</i>		
	<i>Rivers</i> , 5.	<i>Rise.</i>	W. to E. Japan Sea.		
	Yamour,	Tartary,	S. to N. Yamour.		
	Argun,		W. to S. } Nanking Bay.		
	Yellow,	Junnan.	N. E. } Chin. Sea.		
	Kiam,	Queicheu.	S. to E.		
	Tay,				

EAST-INDIES, S. E. of Rome.

Lat. Long. Length. Breadth. Sq. Miles. N^o Inhabit.
 3° to 40° N.—66° to 109° E.—4000M.—3500M.—1,857,500.—110,000,000.

Cb. To. Clim. Dist. from London.
Boundary. } Tartary, N. Indian Ocean, S. } Delli, { IV. } 3720 } *mi.* } N.W.
 } China, E. Persia, W. } Siam, { II. } 5040 } *mi.* }

XXII Kingdoms, Ch. Towns.			Kingdoms. Ch. Towns.		
Indoff. 4.	Lahor, N.	Lahor.	Beyond Ganges 12.	Azem,	Azem.
	Bengal, N. E.	Calcutta.		Ava,	Ava.
	Delli,	Delli,		Aracan,	Aracan.
	Agra,	Agra.		Pegu,	Pegu.
Within Gang. 6.	Orixa,	Orixa.		Martaban,	Martaban.
	Golconda,	Golconda.		Siam,	Siam.
	Bisnagar,	Bisnagar.		Malacca,	Malacca.
	Tanjour,	Tanjour,		Tonquin,	Chacao.
	Cambaya, N.	Surat,		Laos,	Lanchang.
	Decan, Middle.	Visapore.		Cochinch,	Thoanoa.
				Cambodia,	Cambodia.
				Chiampa,	Padram.
Seas, 1. Indian Ocean, S. W.			Rivers, 9. Rise. Course. Fall.		
Gulphs, 2. Cochinchina, N. W. Cam- baya, N. W.			Indus,	Tartary,	S. India Oc.
Bays, 2. Siam, S. E. Bengal, S.			Ganges,	Balagate,	S. E. } Bay of Bengal.
Streights, 2. Malacca, S. E. Rama- nakoel, S. W.			Christina,	Ava,	S. }
Capes, 3. Siam, S. E. Comorin, S. Dieu, W.			Jemina,	Jengapore,	Ganges.
Lake, 1. Chiemy, N.			Domea,	Tonquin,	Chinese
Mountains, 4. Caucasus, N. W. Nagra- cut, N. E. Balagate, N. to S. Sar- donix, N.			Mecon,	Tartary,	Sea.
			Menam,	Siam,	Siam Bay.

PERSIA, Kingdom, S. W. of Rome.

Lat.	Long.	Length.	Breadth.	Sq. Miles.
25° to 44° N.	— 45 to 70° E. —	1300 M.	1100 M.	800,000.
Boundary. Circassia, N. Persian Gulph, S. India, E. Turkey, W.				
Title. Pathshaw, Sultan, Cham.				
Chief Town. Isfahan.—Climate IV.—Distance from London, 2460 Miles,				
S. E. Inhabitants 500,000.				

DIVISIONS IV.

East 3.	{	12 Provinces.	Ch. Towns.	Seas, 2.	Caspian, N. Indian, S.
		Choroffian,	Mesched.	Gulphs, 2.	Bafforah, Ormus, S.
		Sablestan,	Bost.	Lakes, 2.	Aftamar, Babacombar,
		Sigistan,	Sigistan.	N.	
		Mackeran,	Mackeran.	Mountains, 2.	Caucasus, Ararat, N.
		Kerman,	Gombroon.	W.	
		Faristan,	Schiras.		
		Chufistan,	Soufter.	Rivers, 6.	Rise. Course. Fall.
		Irac-Agem,	Isfahan.	Orus,	Tartary, W.
		Curdistan,	Betlis.	Kur,	{ Cas- pian Sea.
Aderbeirzen,	Tauris.	Ataxes,			
Dagistan,	Terki.	Euphrates,			
NW. 3	{	Schirwan,	Derbent.	Tigris,	{ See Turkey, in Africa.
				Indus.	

University, Schiras,

TARTARY,

TARTARY, N.E. and W. of Rome.

Lat. Long. Length. Breadth. Sq. Miles.
 30 to 72° N. — 50° to 150° E. — 4000 M. — 2400 M. — 778,290.
 Boundary. Frozen Ocean, N. China, Ind. Sea, S. Pacific Ocean, E. Muscovy, W.

DIVISIONS V.

	Subdivisions.	Cb. Towns.		Subdivisions.	Cb. Towns.
SE. N.E. Mid. 3.	1. Kamschatka,	Kamschatka	NW SW	1. Samoieda,	Mangasia.
	2. Jakutskoi,	Jakutskoi.		2. Ostiac,	Kortskoi.
	3. Bratski,	Bratski.		3. Circassian,	Torki.
	4. Mogul,	Thibet.		4. Astracan,	Astracan.
	5. Siberia,	Tobolski.		Chinese Tartary.	See China.
	6. Kalmuc,	Botharia.			
	7. Usbec,	Samakand.			

	Chief Towns.	Climate.	Distance from London.	
	THIBET.	V.	3760	} Miles, North-East.
	TOBOLSKI.	XI.	2160	
	SAMARCAND.	VIII.	2800	
Seas, 2.	Kamschatka, N. Caspian,		Rivers, 7.	Rise. Cou. Fall.
W.			Jenska,	} Ubec, N. Froz. Oc.
Lakes, 7.	Corus, Kithack, Baikel,		Lena,	
N. Kisan, Kologal, Kithay, Middle.			Wolga,	} See Russia.
Mountains, 2.	Stolph, N. Caucasus,		Tobol,	
W.			Irtis,	
			Oby,	} See China.
			Argun,	

TURKEY, Empire, S.W. of Rome.

Lat. Long. Length. Breadth. Sq. Miles.
 28° to 45° N. — 27° to 46° E. — 1000 M. — 800 M. — 502,820.
 Boundary. Black Sea, N. Arabia, S. Persia, E. Archipel. W.
 Title. See Turkey, in Europe. — Chief Town. Aleppo. — Climate. VI. —
 Distance, from London, 1860 Miles. — Inhabitants, 235,000.
 Patriarchs and Bishops. See Turkey, in Europe.

DIVISIONS II.

	Subdivisions.	Cb. Towns.	Seas.	See Turkey, in Europe.
Eastern, 7.	1. Irac-Arab,	Bagdat.	Lakes, 2.	Roumi, S. E. Asphaltis, S.
	2. Diarbec,	Diarbec.	Mountains, 6.	Caucasus, Ararat, N. E.
	3. Curdistan,	Betlis.		Libanum, Hermon, S. Taurus, E.
	4. Turcomania,	Erzerum.		Olympus, N. W.
	5. Georgia,	Tefflis.	Rivers, 7.	Rise. Cour. Fall.
W. 4.	6. Syria,	Aleppo.	Euphrates,	} Armenia, S. E. Persian G.
	7. Palestine,	Jerusalem.	Tigris,	
	8. Natolia,	Bursa.	Kara,	Aladulia, E. Euphrates
	9. Amasia,	Amasia.	Sarabat, Natolia,	} W } Archipel.
	10. Aladulia,	Ajazzo.	Meander, Ca-aman,	
	11. Caramania,	Satalia.	Orontes, Syria,	} Levant.
			Jordan, Palestine,	
				S. Dead Sea.

ASIATIC

ASIATIC ISLES, XXVII.

<i>Isles.</i>	<i>Cb. Towns.</i>	<i>Isles.</i>	<i>Cb. Towns.</i>
Amboyne,	Amboyne.	Nicobar,	Nicobar.
Andaman,	Andaman.	Philippines,	Manilla.
Banda,	Lantor.	Sumatra,	Achan.
Bombay,	Bombay.		
Borneo,	Borneo.	<i>Archbishops.</i> GOA, 1.	
Celebes,	Macassar.	<i>Bishops,</i> 4. Cochin, Malaca, St. Thomas, Macao.	
Ceylon,	Candy.		
Formosa,	Taiouanfou.		
Gilolo,	Gilolo.		
Japan,	Jeddo.		
Java,	Batavia.		
Ladrones,	Guam.		
Maldives,	Caridon.		
Moluccas,	Victoria.		

MANILLA, 1.
Bishops, 3, Nombre de Jesus, Nueva Segovia, Caceres de Camerina.
University. Goa.
 2 Archbishops, 7 Bishops, 1 University.

In this QUARTER.

III *Empires.* Mogul, China, and Japan.

XVIII *Principal Kingdoms.* Persia, Yaman, Azem, Aracan, Ava, Tangut, Borneo, Cambodia, Tornate, Cochinchina, Corea, Candy, Laos, Imertia, Maldivia, Macassar, Tonquin, and Siam.

Chief Commodities. Gold, Diamonds, Incense, Spices, Drugs, China, Japan-Ware, Silk, Musk, Rhubarb, Myrrh, Tea, Coffee, Quicksilver, and Furs.

Greatest Curiosities. A Brick Wall, with square Towers at every Mile, to keep out the Tartars, of 1800 Years standing, 1500 Miles in Length, and 30 Feet high, broad enough for eight Persons to ride a-breast of each other.

A F R I C A.

Position, S. W. — Climate from I to VI, North, — I to V, South.

Lat. Long. Length. Breadth. Sq. Miles.
 37° N. to 35° S. — 18° W. to 50° E. — 4300 M. — 4200 M. — 9,654,807.
 Inhabitants, 150,000,000.

Boundary. { Mediterranean, } Sea, { N. } Pacific { S.
 { Indian, and Red, } { E. } Atlantic { Ocean, { W.

Languages, 12. Arabic, Coptic, Greek, Abyssinian, Caffrian, Sangal, Guler, Gualata, Bolm, Fimna, Lingua Franca, and Acaniftian.

Empire, E. A B Y S S I N I A.

Lat. Long. Length. Breadth. Sq. Miles.
 6° to 45° N. — 20° to 42° E. — 1320 M. — 1100 M. — 1,204,500.
Boundary. Egypt, N.—Anian, S.—Red Sea, E.—Desert, W.—Distance from London 2880 Miles, S. E.

D I V I S I O N S VI.

<i>Subdivisions.</i>	<i>Cb. Towns.</i>	<i>Title.</i>
Abex, E.	Doncala.	Emperor, Negus, or Negascha.
Monomotapa,	Mogar.	<i>Chief Town,</i> GONDAR. Climate II.
Monoemugi,	Merango.	<i>Order.</i> St. Anthony.
Abyssinia,	Gondar.	<i>Lakes,</i> 5. Niger, N. Aquilunda, Mid.
Nubia, W.	Nubia.	Sachaf, Zara, Zanibre, S.

C

Mountains,

THE BRITISH PALLADIUM, OR

Mountains, 4. Zaftan, S. Zamora, W. Bafilian, N. Luna, S.

Rivers, 3.	Rife.	Course.	Fall.
Niger,	Burnou,	} W.	} Atlantic Ocean.
Zaire,	Zamora,		
Infanto,	Cafraria, S. E.		
Nile,	See Egypt.		

B A R B A R Y, N.

Lat.	Long.	Length.	Breadth.	Sq. Miles.
29° to 37° N.	—11° W. to 30° E.	—2300 M.	—380 M.	—558,800.
Boundary. Mediterranean, N.—Biledulgerid, S.—Egypt, E.—Atlantic, W.				
Chief Town, Fez.—Climate V.—Distance from London, 1080 Miles, S.				
Inhabitants, 30,000.				

Divisions, VII.	Cb. Towns.	Divisions.	Cb. Towns.
Algiers,	} N. {	Morocco, N. W.	Fez.
Tunis,		Biledulgerid,	Dara.
Tripoli,		Zaara,	Tegefia.
Barca,		Docra.	
Bays, 9. Marfilquivir, Oran, Algiers, Bugia, N. Carthage, Tunis, Sibra, E. Tetuan, Tangier, N. W.			
Capes, 16. Tegula, Falcon, Ivy, Cambron, Bugia, Metefuz, N. Biferta, Carthage, Eona, Mezurat, Rozatim, E. Three Forks, Spartel, Cantin, Non, Bajador, W.			
Mount Atlas, S.			

C A F F R A R I A, S.

Lat.	Long.	Length.	Breadth.	Sq. Miles.
24° to 35° N.	—15° to 35° E.	—1120 M.	—700 M.	—200,340.
Boundary. Monomotapa, N. So. Sea, E.				
South-Sea, { S. {				
Divisions, II.				
Terra de Natal,	} S. {	Cb. Town.		
Caffrian Coast,		Cape Town.		
Bays, 5. St. Helena, Soldania, Table, W. Hermosa, St. Bras, E.				
Capes, 2. Good Hope, Anguillas, S.				
Mountains, 2. Table, Sugarloaf, W.				

E G Y P T, Kingdom, N. E.

Lat.	Long.	Length.	Breadth.	Sq. Miles.
20° to 32° N.	—28° to 36° E.	—600 M.	—250 M.	—140,700.
Boundary. { Mediterranean, N. Abyfinia, S. } Distance from London 1920				
{ Red Sea, E. Barca, W. } Miles, S. E.				
Divisions, II.				
Lower Egypt, N.	} Cb. Towns.	Lake, 1. Elbuclara, W.		
Upper Egypt, S.		Grand Cairo.	Mountain, 1. Gianadel, W.	
Ch. Town, G. CAIRO.—Climate IV.				
River, Rife. Course. Fall.				
Nile, Abyfinia, S. to N. Levant.				

GUINEA,

GUINEA, S. W.

Lat.	Long.	Length.	Breadth.	Sq. Miles.
4° to 10° S.—15° W. to 15° E.—	1800 M.—	360 M.—	1,494 600.	
Boun- { Negrol, N. } dary. { Defert, E. }	Atlantic, { S. W.	Capes, 11. Blanco, Verd, Leon, St. Anne's, Palmas, Three-Points, For- mosa, St John, Lopas, Lede, Negro, W. Mountain, 1. Sierra Leon, E. Rivers, 10. Rise. Course. Fall.		
DIVISIONS II.				
8 Subdivisions. Chief Towns.				
5. Southern, { Matatana, Benguela, Angola, Congo, Loango, Benin, Guinea Prop. Negroland,	{ Benguela. Loando. St. Salvador. Loango. Benin. Cape Coast Castle. James Fort.	{ Coanzo, Ambrizi, Zaara, Lunde, Cameron, Formosa, Volta, Sierra Leon, Shorbro, Niger, See Abyssinia.	{ An- gola, Con- go, Gui- nea Pro- per,	{ E.to W. N. E. N to S. E.to W.
				{ Atlan- tic. South Sea. Gui- nea B. Atlan- tic.
Bays, 2. Cintra, Guinea, W.				

ZANGUEBAR, S. E.

Lat.	Long.	Length.	Breadth.	Sq. Miles.
Equat. to 23° S.—34° to 40° E.—	350 M.—	1400 M.—	372.500.	
Boun- { Anian, N. Defert, S. dary. { Ind. Oc. E. Monomugi, W.		Divisions. Chief Towns. { Mosambique, Mosambique. { Sofala, Sofala.		
Divisions, III. Chief Towns.				
N. { Melinda, Mombaze, Raphael, Quiloo,	{ Melinda. Mombaze. Montagnaze, Quiloo.	Chief Town, Melinda. — Climate I. Distance from London 4440 Miles, S. E.		

AFRICAN ISLES.

Isles.	Chief Towns.	Isles.	Ch. Towns.
N. E. { Zocotora, Babelmandel, Madagascar, Comorra, Bourbon, Mauritius, St. Helena, St. Thomas,	{ Calania. Babelmandel. St. Austin. Joanna. Bourbon. Mauritius. St. Helena. St. Thomas.	W. { Ascension, Anabo, St. Matthew, Cape Verd, Canary, Madeiras, Teneriff, Ferro, Azores,	{ Ascension. Anabo, St. Matthew. St. Jago. Palma. Funchal. St. Christopher. Oratavia. Angra.

In this QUARTER.

IV Empires. Abyssinia, Monomotapa, Monoemugi, and Morocco.

III Deyr. Algiers, Tunis, and Tripoli. — I Republic. Brava.

XIV principal Kingdoms. Adea, Benin, Tombut, Acquamboe, Angola, Benguela, Biafara, Dahomy, Ganara, Nubia, Congo, Loango, Gingiro, Ca-
congo.

ANNUAL MISCELLANY, 1779.

21

<i>Lakes</i> , 6. Ontario, Erie, E. Champlain, Hudson, Michigan, Superior, N.W.								
<i>Mountains</i> , 3. Cherokee, N. Ladies, E. to W. Apalachian, W.								
<i>Rivers</i> , 12.		<i>Rise.</i>	<i>Course.</i>	<i>Fall.</i>	<i>Rivers.</i>	<i>Rise.</i>	<i>Course.</i>	<i>Fall.</i>
St. Laurence,	Canada,	N. E.	} Atlantic Ocean.		Connecticut,	N. England,	S.	} Atlantic Ocean.
Altamaha,	Georgia,	E S E.			Rupert,	N. Britain,	W.	
St. John,	Florida,	N to E			Penobscot,	N. Scotland,	N E	
Delawar,	Pennsylvania,	S.			Nelson,	N. Wales,	W.	
Powtomac,	Virginia,	} S. E.			Mississippi,	Louisiana,	S. Mexico G.	
Ashly,	Carolina,				Chio,	N. York,	SW. Mississippi.	

SPANISH DOMINIONS, S. S. W.

Lat.	Long.	Length.	Breadth.
8° to 46° N. —	83° to 136° W. —	4000 M. —	2200 M.
<i>Boundary.</i> Unknown Lands, N.—Florida, E.—South Sea, S. and W.			
<i>Divisions</i> , III.	<i>Cb. Towns.</i>	<i>Cb. Town</i> , Mexico.—Climate, III.—	
Old Mexico, S.W.	Mexico,	Distance from London, 4900 M. S. W.	
New Mexico, S.	Santa Fé,	<i>Seas</i> , 2. Pacific, S.W. Caribbean, E.	
California, W.	St. Juan,	<i>Gulphs</i> , 2. Mexico, N. California, N. W.	
<i>Bays</i> , 5. Campeachy, N. Honduras, E. Acapulco, Amapala, and Salenas, S.			
<i>Capes</i> , 14. Sardo, St. Martin, Cornducedea, Catoche, Honduras, Cameron, Gracias Dios, Three Points, E. Blanco, Burica, Santa Maria, S. Corientes, St. Luca, St. Augustin, W.			
<i>Lakes</i> , 4. St. Joseph, N. Mexico and Peru, Middle; Nicaragua, S.			
<i>Mountains</i> , 5. Azul, Nevada, St. Clare, N. W. Leon, S. E. Buffadore, W.			
<i>Rivers</i> , 3.	<i>Rise.</i>	<i>Cour.</i>	<i>Fall.</i>
Del Norte, N. Mexico, S.E.	} Mexico	} Gulph.	<i>Archbishops</i> , 2. MEXICO, 1.
Panuco, O. Mexico, E.			<i>Bishops</i> , 11. Gautimala, Nicaragua, Mechoachan, Guadalajara, Angeles, Chiapa, Vera Paz, Merida,
Colorado, California, W.			Durango, Santa Fé, Guaxaca.
California			St. DOMINGO, 1.
<i>Universities</i> , 3. Guatimala, Mexico, and St. Domingo.			<i>Bishops</i> , 5. St. Jago, St. Juan, Venezuela, Honduras, Conception.
			<i>Archbishops</i> , 2. <i>Bishops</i> , 16.

SOUTH AMERICA.

SPANISH DOMINIONS, N. and S. W.

Boundary. Atlantic, N. E. Pacific Ocean, S. W.

<i>Divisions</i> VI.	Lat.	Long.	Len.	Bre.	<i>Chief Towns.</i>
Terra Firma, N.	Equ. to 12° N.	60 to 82, W.	1400 M.	700 M.	Panama.
Peru, W.	Equ. to 25° S.	60 to 81, W.	2000	600	Lima.
Chili, S. W.	25° to 45° S.	75 to 85, W.	1200	600	St. Jago.
La Plata, S. E.	12° to 37° S.	50 to 75, W.	1500	1100	Buenos
Patagonia, S.	15° to 57° S.	70 to 85, W.	700	300	[Ayres.
Amazonia, Mid.	1° N. to 15° S.	50 to 70, W.	1200	960	
<i>Cb. Town</i> , LIMA,—Climate II, S,—			Distance from London 5520 M. S. W.		
			Sound		

Sound and Island. Falkland, subject to Great-Britain.

Bays, 8. Panama, Bonaventura, N. W. Guávaquil, Notre Dame, Coquinbo, S. W. Camarones, Anegaga, St. Matthias, S. E.

Isthmus, 1. Darien, N. W.

Streights, 2. Magellan, Le Maire.

Capes, 6. St. Vela, Nassau, Cabelo, Horn, Blanco, Noir, S.

Lakes, 5. Parime, N. Tagatagua, W. Caracoroes, S. Xarayes, Middle.

Mountain, 1. Andres, S.

Rivers, 6. *Rise.* *Course.* *Fall*

Amazones, Peru. E. } Atl.

Oronooko, Terra Firma, NE } Oc.

Plata, Paraguay, S. } O.

Valparaíso, Chili, W. } Pacif. O.

Chuquimayo, Peru, WNW. } cean.

Desaguadero, Patagonia, S. }

Archbishops, 3. LIMA I.

Bishops, 8. Cusco, Quito, Arequipa, Truxillo, Guamanga, Panama, St. Jago, and Conception de Chili.

SANTA FE' DE BOGOTA, I.

Bishops, 3. Santa Marta, New Granada; Cartagena, Terra Firma; Popayan, Popayan.

LA PLATA, I.

Bishops, 5. Paz, St. Miguel, Santa Cruz, Buenos Ayres, Assomption.

Archbishops, 3. *Bishops,* 16.

Universities, 2. Lima and Quito.

PORTUGUESE SETTLEMENTS.

BRASIL, E.

Lat. *Long.* *Length.* *Breadth.*
Equator to 35° S. — 35° to 60° W. — 500 M. — 700 M.
Boundary. Amazones, N. Plata, S. Atlantic, E. Amazonia, W.
Chief Town. St. SALVADOR. — *Climate* II. — *Distance from London* 6000 M. S. W.

<i>Divisions,</i> 3.		<i>Chief Towns.</i>	<i>Divisions,</i>		<i>Chief Towns.</i>
Northern, 8.	{ Para,	Para.	Middle, 5.	{ Serigippe,	Serigippe.
	{ Marignan,	St. Lewis.		{ All Saints Bay,	St. Salvador.
	{ Siara,	Siara.		{ Ilheos,	Paya.
	{ Petagues,	St. Lue.		{ Porto Seguro,	Porto Seguro.
	{ Rio Grande,	Tignares.		{ Spirito Sancto,	Spirito Sancto.
	{ Payraba,	Payraba.	2.	{ Rio Janeiro,	St. Sebastian.
	{ Tamara,	Tamara.		{ St. Vincent,	St. Vincent.
Southern, 8.	{ Fernambuca,	Olinda.			
	{ }				

Pays, 4. Cuma, N. Todos Sanctos, Vazabaris, S. E. St. Salvador, S.

Isles, 3. Fernando, N. Santa Barbara, E. St. Catharine, S.

Capes, 4. St. Roque, N. St. Augustin, E. Frio, St. Mary, S.

Mountains, 2. Pascal, E. Rois Magnes, S. E.

Rivers, 6. *Rise.* *Course.* *Fall.*

Real, } Serigippe, } N.E. }

St. Francis, } Grande, } E. }

Grande, } Ilheos, } S. E. }

Ilheos, } Janeiro, } W. to E. }

Janeiro, } Paraiba, }

Paraiba, }

Archbishop, 1. St. SALVADOR.

Bishops, 3. Olinda, St. Sebastian, St. Lewis.

FRENCH and DUTCH SETTLEMENTS.

Lat. *Long.* *Length.* *Breadth.*
Equator to 7° N. — 50° to 60° W. — 780 M. — 480 M.
Boundary,

Boundary. Atlantic, N. E. Amazopia, S. Terra Firma, W.

<i>Cb. Towns.</i>	<i>Distance from London.</i>	<i>Climate.</i>
CAYENNE, } SURINAM, }	3840 Miles, S. W.	I. North.

NORTH-AMERICAN ISLES, XVIII.

WEST-INDIES.

<i>Isles.</i>	<i>Cb. Towns.</i>	<i>Isles.</i>	<i>Cb. Towns.</i>
Cape Breton,	Louisburgh.	Montserrat,	Plymouth.
St. John,	Charlotte Town.	St. Vincent,	Kingston.
Bermudas,	St. George.	Granada,	St. George.
Bahama,	Nassau.	Cuba,	Havannah.
Jamaica,	Kingston.	Hispaniola,	St. Domingo.
Barbadoes,	Bridgetown.	Porto Rico,	Porto Rico.
St. Kitts,	Basseterre.	Martinico,	St. Peters.
Antigua,	St. John's.	Guadaloupe,	Port Royal.
Nevis,	Charles-Town.	St. Croix,	Basse End.

Besides St. Eustace, Margarita, Curassou, Bonaire, &c.

SOUTH-AMERICA was first discovered by *Christopher Columbus*, a *Genoese*, in 1492. Cabot afterwards discovered *North-America*, unknown to *Columbus*. This Country was named *America*, from *Americo Vespucci*, a *Florentine*, in 1497, instead of by *Columbus*.

Chief Productions of South-America. Gold, Silver, Pearls, Emeralds, Jaspers, Amethysts, Topazes, Brasil Wood, Amber, Balsam, Jesuits Bark, Gums, Drugs, &c.

Chief Productions of North-America. Iron, Furs, Cotton, Indigo, Sugar, Cocoa, Tobacco, Pepper, Ginger, Pine Apples, Vanilla, Turtles, Parrots, Cochineal, Lignum Vitæ, Logwood, Gums, Drugs, &c.

Greatest Curiosity. NIAGARA FALLS of Water.

THE Manner of the first Discovery, and History of the Conquest, of South-America, or that Part of it called *Mexico* and *Peru*, subsisting in Splendour and Glory, for Ages before, the richest Country, in Gold and Jewels, of the whole Globe; and the Cruelties exercised in the Conquest, over the then civilized Natives, by the barbarous Conquerors, *Ferdinando Cortez*, of *Spain*, (Rival to the worthy Discoverer, *Columbus*,) *Pizarro*, and *Almagro*, hired Natives of *Panama*, of vulgar Extraction, to be concisely related hereafter, will strike our Readers with Horror and Astonishment! So many Millions of innocent Inhabitants destroyed, (and by the most cruel Deaths,) merely to secure a *Dominion*, by Depopulation, over two large Empires, (*Mexico* and *Peru*,) in that before flourishing and populous Country, is shocking to Humanity. These *Devastations* and *Revolutions* of settled and peaceable Empires are sufficient to induce a reasonable Mind to think that either these Governments of *Mexico* and *Peru* were founded on Injustice and Barbarity, or that, being over-run with shocking Vices, *Providence* permitted their Destruction: Since, without such Causes admitted, rival Governments would be the Terror instead of the Protection and Happiness of Mankind.

OMITTED.

O M I T T E D.

Strombolo, a Volcana, }
 Cape Pelorus, } in Sicily.
 Scylla and Charybdis, }

The Bishopric of *Salisbury*.

Pontza Isle, } belongs to
 Popo, }

C A L L E D.

Eolian Isles, Lipari.
 Demona, Valdemona.
 Ombria, Spoleto.
 Thibet, Tangut.
 Vandinoto, Noto.
 the Pope, *Catholic*.
 Prince of Popo, *Pagan*.

A P P E N D I X.

Of the different Names of Places and Countries.

	<i>Called.</i>		<i>Called.</i>
Acham,	<i>Azem.</i>	Gaunt,	<i>Ghent.</i>
Albania,	<i>Braidalbane.</i>	Gianish,	<i>Nicopoli.</i>
Almarfa,	<i>Marsalquivis.</i>	Giustandel,	<i>Ocrida.</i>
Anjouan,	<i>Joanna.</i>	Governaport,	<i>William F.</i>
Anflo,	<i>Christiana.</i>	Gorgones,	<i>Cape Verd Isles.</i>
Antilles,	<i>Caribbees.</i>	Groynes,	<i>Corunna.</i>
Asperosa,	<i>Abdera.</i>	Guanihana,	<i>Cat Isle.</i>
Aumale,	<i>Albemarle.</i>	Gurgistan,	<i>Georgia.</i>
Aurigni,	<i>Alderney.</i>	Guzurat,	<i>Cambaya.</i>
Bander Abassi,	<i>Gombron.</i>	Hesperides,	<i>Cape Verd Isles.</i>
Barantola,	<i>Tangut.</i>	Hippo,	<i>Bona.</i>
Brassau,	<i>Cronstrat.</i>	Hispaniola,	<i>St. Domingo.</i>
Byzantium,	<i>Constantinople.</i>	Hottentots,	<i>Cafraria.</i>
Cachmexe,	<i>Cassimire.</i>	Jambul,	<i>Baluclava.</i>
Caribiana,	<i>Guiana.</i>	Javerin,	<i>Raab.</i>
Cefala,	<i>Sofala.</i>	Illyria,	<i>Croatia & Dalmatia.</i>
Chaldea,	<i>Babylonia.</i>	St. John,	<i>Porto Rico.</i>
Chios,	<i>Scio.</i>	St. John de Leon,	<i>Caracos.</i>
Coban,	<i>Vera Paz.</i>	Ionia,	<i>Natolia.</i>
Colchis,	<i>Mingrelia.</i>	Iffus,	<i>Ajazzoo, Turkey.</i>
Coreyra,	<i>Corfu.</i>	Judea,	<i>Palestine.</i>
Crab's Isle,	<i>Borriquen.</i>	Jurgantz,	<i>Urgantz.</i>
Crete,	<i>Candia.</i>	King's Isles,	<i>Pearl's Isles.</i>
Cronstat,	<i>Cronstat.</i>	Labrador,	<i>New Britain.</i>
Cytherea,	<i>Cerigo.</i>	Lacedemon,	<i>Mistira.</i>
Darha,	<i>Dras.</i>	Leeward Isles,	<i>Caribbees.</i>
Decan,	<i>Visapore.</i>	Lesbos,	<i>Metelino.</i>
Dresno',	<i>Silistria.</i>	Lofreyes,	<i>Lima.</i>
Ecbatana,	<i>Tauris.</i>	St. Lucar,	<i>Nicoya.</i>
Edeffa,	<i>Orfa.</i>	Lucaya,	<i>Babama.</i>
Epirus,	<i>Canina.</i>	Luconia,	<i>Manilla.</i>
Eskimaux,	<i>New Britain.</i>	Lycia and Lydia, see	<i>Natolia.</i>
Euripus, }	<i>Negropont.</i>	Madrastapatan,	<i>St. Geo. Asia.</i>
Eubæa, }		Malines,	<i>Mecklin.</i>
Eyrac, or	<i>Irac.</i>	Malouines,	<i>Falkland Isles.</i>
Fidah,	<i>Whidab.</i>	Mariannes,	<i>Ladrones.</i>
Fortunate Isles,	<i>Canaries.</i>	Masovia,	<i>Warsovia.</i>
			<i>Mesopotamia,</i>

	<i>Called.</i>		<i>Called.</i>
Mesopotamia,	<i>Diarbeck.</i>	Spain, New,	<i>Mexico.</i>
Nassau Isle,	<i>Long Isle.</i>	Spanish Town,	} <i>St. Jago de la Ve-</i>
Numantia,	<i>Soria.</i>	Jamaica,	
Numidia,	<i>Biledulgerid.</i>	Spitzbergen,	<i>Greenland.</i>
Oporto,	<i>Porto.</i>	Sporades,	<i>Cyclades.</i>
Orcades,	<i>Orkneys.</i>	Stalimene,	<i>Lemnos.</i>
Osero,	<i>Bicle.</i>	Stambul,	<i>Constantinople.</i>
Paphlagonia,	<i>Amasia.</i>	Strigonia,	<i>Gran.</i>
Papous,	<i>New Guinea.</i>	Stuhl Wrissemburgh	<i>Alba Royal.</i>
Paraguay,	<i>Plata.</i>	Summer Isles,	<i>Bermudas.</i>
Paria,	<i>New Andalusia.</i>	Sunderland,	<i>Sudermania.</i>
Pataos,	<i>Philippines.</i>	Tadousac,	<i>Saguenay.</i>
Pomona Isle,	<i>Mainland.</i>	Tanday,	<i>Samari.</i>
Providence Isle,	<i>Abacco.</i>	Tangermund,	<i>Angermund.</i>
Prusa,	<i>Bursa.</i>	Terra Magellan,	<i>Patagonia.</i>
Querissas,	<i>Curassou.</i>	Theffaly,	<i>Janna.</i>
Quilon,	<i>Coulan.</i>	Thiva,	<i>Thebes, Greece.</i>
Rumelia,	<i>Romania.</i>	Thomas, St.	<i>Meliapour.</i>
Saguntum,	<i>Morviedro.</i>	Thomond,	<i>Clara.</i>
Salamis,	<i>Coluri.</i>	Thule,	<i>Sbetland.</i>
Saycock,	<i>Bungo.</i>	Torne Lapmark,	<i>Lapland.</i>
Scanderoon,	<i>Alexandretta.</i>	Triers,	<i>Treves.</i>
Scandinavia,	} <i>Denmark, Sweden,</i>	Trinidad,	<i>Buenos Ayres.</i>
		Turgow,	<i>Gouda.</i>
Scotland, New,	<i>Acadia.</i>	Valetta,	<i>Malta.</i>
Serena,	<i>Coquimbo.</i>	Ubes, St.	<i>Setubal.</i>
Settines,	<i>Atbens.</i>	Veer,	<i>Terwere.</i>
Sham,	<i>Damascus.</i>	Uladislaw,	<i>Inowladislaw.</i>
Siden,	<i>Gioddab.</i>	Uly,	<i>Fly.</i>
Sinda,	<i>Tatta.</i>	Weissenburgh,	<i>Alba Julia.</i>
Smaland,	<i>Gotbland.</i>	William's Fort.	<i>Inverl'ocky.</i>
St. Jutland,	<i>Sleswick.</i>	Zebeu,	<i>Hermanstadt.</i>
Sogdiana,	<i>Ubec Tartary.</i>	Zaara,	<i>Sabara.</i>

☞ Thus the geographical *Skeletons*, of *Europe, Asia, Africa, and America*, are finished; to which we shall add all the necessary Parts to make them *intelligent* and useful Beings.

We shall, hereafter, give a short historical Account of the Rise and Progress of Nations, Government and Religion; Laws, Arts, and Commerce, of our own *GLOBE*; whatever is done in the *interstellar* Worlds, of which we are yet ignorant.

Then a short historical and natural Account of the Particulars of the *FOUR QUARTERS*; beginning with *Europe*. With a *methodical* Account of each particular Country.

Air,	Metals,	Religion,	Chief Towns,
Soil,	Curiosities,	Laws,	Buildings,
Climate,	Antiquities,	Customs,	Trade,
Produce,	Coins,	Manners,	Manufacture,
Forests,	Population,	Language,	Commerce,
Mountains,	Inhabitants,	Learning,	Military and
Animals,	Constitution,	Universities,	Naval Force.
Minerals,	Government,	Cities,	

D

LENGTH

LENGTH of MILES in different PLACES.

Not only different Countries differ in their Length of Miles, as the *French* Miles differ from the *English*, but the Miles in the same Country vary in different *Provinces*, and all from the same Standard. The common *English* Mile differs from the *Statute* Mile. The *French* use three Sorts of Leagues.

Dr. Halley's Comparison of Miles, in different Places, is as follows:

- One *English* Statute Mile consists of 5280 Feet, 1760 Yards, or 8 Furlongs.
- One *Russian* *Vorst*, a little more than $\frac{1}{4}$ of an *English* Mile.
- One *Turkish*, *Italian*, and *Old Roman*, less Mile, nearly equal to 1 *English* Mile.
- One *Arabian* Mile, ancient and modern, about $1\frac{1}{4}$ *English* Mile.
- One *Scotch* and *Irish* Mile, about $1\frac{1}{2}$ *English*.
- One *Indian* Mile about 3 *English*.
- One *Dutch*, *Spanish*, and *Polish* Mile, about $3\frac{1}{2}$ *English*.
- One *German* Mile above 4 *English*.
- One *Swedish*, *Danish*, and *Hungarian* Mile, from 5 to 6 *English*.
- One *French* common League nearly 3 *English*.
- One *English* League, 3 *English* Miles.
- One *Degree*, of a great Circle of the Globe, contains 60 *Sea-Miles*, or 20 *Sea-Leagues*.

PALLADIUM-AUTHOR.

A D V E R T I S E M E N T.

* * Correspondents and Palladium Members are desired to send their Orders, and Money with them, for Palladium: they send for at Booksellers Price, to Mr. Bew's, Bookseller, in Pater-noster-Row, London, where they may have a Receipt for the Payment thereof; and their Palladiums will be duly conveyed to them, by that Publisher, and Proprietor of the Palladium Copy. The Expence of a single Palladium, for the present, is raised to 1s. 6d. to defray the excessive Expence of printing the difficult Subjects.

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P A R T II.

ANSWERS to the *ÆNIGMAS* in last Year's PALLADIUM.

- | | | |
|---------------|-----------------|-----------------|
| I. PLOUGH. | IV. AMPHISBÆNA. | VII. NEWSPAPER. |
| II. BED. | V. SAW. | VIII. WINDMILL. |
| III. NOTHING. | VI. OVEN. | IX. HONEY-MOON. |
- Prize. NIGHT.

Mr. Robert Marsh, of Horsley, Lancashire, answered all the *Ænigmas* in Versification.

All

All answered, but IV, by Mr. W. Swift, of Stow, near Lincoln, in a Complaint for the Loss of his Bride.

I.

MY Days of Delight are no more,
No more my sweet Moments of Peace;
The Smiles of my Morning are o'er,
And NIGHT bids my Sorrows increase. *Prize.*

II.

My PLOUGH I have quite thrown aside, *1.*
My PILLOW is NOTHING to me, *2, 3.*
My HONEY-MOON's fled with my Bride, *9.*
Now I my dear MAYO can't see.

III.

'Twas MAYO that made me look gay;
Her Presence enliven'd the Scene;
Her Absence has banish'd the Day,
For she, of the Plain, was the Queen.

IV.

My SAW shall ne'er cut through the Wood, *5.*
Her OVEN with Fuel to fill; *6.*
My Sorrows shall heighten the Flood,
And the NEWS shall be told at the MILL. *7, 8.*

V.

How hard and severe is my Fate,
My Folly has banish'd my Fair:
I repent, ah! my MAYO, too late,
And, justly, I'm doom'd to Despair.

VI.

Ye Nymphs and ye Shepherds, come join,
With me my fair Charmer implore!
Ah! let her but once more be mine,
And she never shall part from me more.

A general Answer to all the Ænigmas, by Mr. W. Turner, Teacher of the Classics and Mathematics, at Witney, in Oxfordshire.

DAMON weds Cbles, Hymen crowns their Joy!
And NOTHING can their HONEY-MOON annoy; *3, 9.*
Warm as an OVEN's Mouth Affection's found, *6.*
And Cupid guards the Marriage BED around. *2.*
But what do Fame and PUBLIC PAPERS say, *7.*
Damon turns Usurer, Cble goes astray.
She dresses, plays, coquets, in public View;
He GRINDS the Poor, with-holds his Servants Due: *8.*
She seeks Occasion for domestic Strife;
Turns AMPHISBÆNA, Poison to his Life! *4.*
He PLOUGHS the Ocean:— So gets rid of Wife. *1.*
Thus, sharp as PIT-SAW, is connubial Hate; *5.*
Days wretched, cheerless NIGHTS, attend their Fate! *Prize.*

Mr. John Needham, of Hinchley, Leicestershire, answered all the ÆNIGMAS in Verse; Mr. John Fletcher, of Halton, near Frodsham, answered them in Prose; as did Mr. Thomas Smith, of Langhurst, Kent; Mr. W. Richardson, of Buckworth; Mr. George Reed, of Catliff. Mr. Dutton answered all but 2, 3, and 7; giving a versified Answer to the Prize. Mr. J. Gruby, of Coventry,

ventry, answered them; as did Mr. Jonathan France, all but 3, 6, and 7. Mr. Isaac Gumley's Muse is employed in the Muses' Library.

☞ The Rev. T. Vaughan's unlimited 4th *Ænigma*, on an *Amphibæna*, was not understood by any Correspondent; which, however, we supplied. This *Unlimitedness* should be a *Rule of Caution* to all *Ænigmatists*, that they duly limit their *Ænigmas* to one Answer only.

When the Circumstances of an *Ænigma* are too general, it will be impossible, for the most acute Penetration, to ascertain what that *Ænigma* is. This *Unlimitedness* we find in several *ænigmatical Compositions* we have sent us. The Composers of which *Ænigmas* think, because a few of the compounding Circumstances are contained in their *Idea*, (defective as it sometimes is,) that every quick-sighted Reader must conceive like them.

But, similar to this *Misconception*, there is the same *Defect* in the *Misconception* of those who *inarticulately* pronounce their Words; thinking, because they understand their own Meaning, that every *muffled*, *muttered*, or *confused*, Pronunciation of Speech, without Regard to *articulate Sound*, is as clear to Others as to themselves. This is found to be a *general Case*, among Persons of no Education, and sometimes among those who have been bred under Teachers at School, for Want of due Attention to the *Articulation*, *Accent*, *Cadence*, *Harmony*, and *Distinction*, of Sounds, in the Use of Speech, they seldom or never rightly put their Speech in Practice.

But we recommend it to *imperfect Speakers* to attend the Wisdom of both Houses of Parliament, and there let them hear with what Energy of *Sound*, *Articulation*, *Oratory*, and *Sense*, the Speeches there, for public Argumentation and Conviction, are pronounced. Which Practice should be a Pattern of Speaking, to shame every *muffled* or talkative *Babler*, from making such an ill Use of Pronunciation and Speech as is commonly observed in *barren* and *uninstructive* Conversation; irksome to every thinking and judicious Hearer. Whereas, a Clearness of Voice, and well *articulated* and connected Speech, delivered with an elevated and forcible Pronunciation, would convey the Meaning of Speakers, with Promptness and Pleasure, to the Understanding and Conviction of attentive Hearers. Youth, at School, should be taught the Force of Pronunciation and Oratory. Let them read *Locke on human Understanding*, to form their Arguments.

As Persons *unpractised* in clear, articulate, distinct, energetic, and harmonious, Sounds, are unfit for *public Orators*, and Instructors of Others, by forcible and connected Arguments; so those will as much miss of their Aim, who write *Ænigmas* and poetical Compositions, without striking Metaphors and Allusions, without adequate and surprising Incidents to brighten and lift their Subjects! See Gumley's *clear, instructive, and connected, Compositions*, without a *Whetstone* required to brighten them, or a *Lord-Chamberlain's Censure* to correct them.

The PRIZE-ÆNIGMA, answered from Young's Night Thoughts, by Amelia Stanhope.

————— O ye,
Who deem one Moment unamus'd a Misery,
Not made for feeble Man! who call aloud
For Baubles and Conceits of ev'ry Cast,
For Change of Follies, and Relays of Joy,
To drag your Patient through the tedious Length
Of a short Winter's Day:— Say, Dreamers of gay Dreams,
O say! how will ye weather an eternal NIGHT,
Where such Expedients fail!

Or thus, by Amelia Stanhope.

Amidst a numerous Croud of Foes around, * *Young and*
By NIGHT* two noble Friends of Worth I've found. *Gumley.*

PRIZE-ÆNIGMA answered by Mr. G. Simpkin, of Finedon.

While feasting my Eyes with *Gumley's* fine Prize,
His musical Strain gave Delight;
When NIGHT did appear, and Darkness drew near, *Prize.*
I the Mystery then brought to Light.

Answered by Mr. Robert Marsh, at Horsley, Lancashire.

Darkness now rose, and brought in low'ring NIGHT,
Her shadowy Offspring; unsubstantial both,
Privation mere of Light and absent Day. *Milton.*

Or thus.

For NIGHT's the Sabbath of Mankind,
To rest the Body and the Mind. *Hudibras.*

Mr. Alexander Rowe's Answer.

While Sol's bright Car is rolling down the *West*,
NIGHT's sable Curtain overspreads the *East*.

Answered by a Son of Mars, at Lamberhurst, Kent.

Could I have my Wish, and the Soldiers Delight,
I'd serve *Mars* by Day, and soft *Venus* by NIGHT.

Answered by Cælebs, of Linton, near Saffron-Walden.

As Darkness draws her sable Vest,
Then Silence bears the Sway;
So Man, in Dust, enjoys his Rest,
Then shares eternal Day.

Mr. John Sharman, of Biteswell, Leicestershire, answered the PRIZE-ÆNIGMA in Verse; as did Mr. J. Cotton, of Huntingdon; Mr. G. Simpson, of Finedon; Mr. William Marsden, of Netherhurst; Mr. Robinson, of Bid-dick. Mr. James Done, of Lutterworth, Leicestershire, proposed an Ænigma on a late Subject; and, therefore, unfit for our Purpose.

ÆNIGMA V. answered by Mr. John Abbot.

A SAW, I think, (it is no Wonder,)
Will cut the hardest Wood asunder.

ANSWERS to the QUERES in last Year's PALLADIUM.

I. QUERE 263, answered by Mr. W. Turner, of Witney, Oxfordshire.

BIRD-FANCIERS assert, that Birds generally make their *Exit* on a *Sprig*,
or *Spray*, near to the Place where they have been accustomed to build their
Nests.

Nests. The ravenous Appetites of Birds and Beasts of Prey, Reptiles, Insects, &c. account for the Rarity of dead Birds being found.

Mr. Alexander Rowe, of Cornwall, answers it thus.

WITHIN the Place where Birds to Rest repair,
They die, and leave their little Lives in Air.

II. QUERE 264, answered by Mr. W. Turner, of Witney, Oxfordshire.

THE late ingenious *William Gutbrie, Esq.* in his *Choreography of New-Britain*, in *Norib-America*, lying between the Latitudes of 50 and 70 Degrees *North*, observes that the tremendous high Mountains in this Country, towards the *North*, being perpetually covered with Snow, and the Winds blowing from thence three Quarters of the Year, occasion a Degree of Cold, in the Winter, over all this Country, which is not experienced in any other Part of the World, in the same Latitude.

III. QUERE 265, answered by the same Correspondent.

AS the Air is a *Fluid*, its natural State is that of Rest, which it endeavours always to keep, or retrieve, by an universal *Equilibrium* of all its Parts. When, therefore, this natural *Equilibrium* of the Atmosphere happens, by any Means, to be destroyed in any Part, there necessarily follows a Motion of all the circumjacent Air towards that Part to restore it; and this Motion of the Air is what is called Wind. And the Reason why, in *England*, the Wind blows colder from the *East* than from the *West* Point of the Compass, is, for the most Part, owing to the *Rarefaction* of the Air by the *Sun*, and the Earth's diurnal Rotation, which is constantly carried from *West* to *East*; so that the Air is moved more towards the *West*; and, consequently, is felt the colder the more forcibly it blows.

IV. QUERE 266, answered by Nobody.

V. QUERE 267, answered by Mr. W. Turner.

THUNDER is a Noise heard from the Regions of the Air, excited by a sudden Kindling and Explosion of sulphureous Exhalations, floating in the Atmosphere. These Exhalations ferment and kindle, and then, flashing like Gun-Powder, occasion those loud Explosions and Streams of Fire, which are called Thunder and Lightening. From the Experiments, made by the indefatigable *Dr. Franklin*, it appears, that *Lightening* is only an *electrical* Fire, drawn off from the Clouds. *Thunder*, then, or *Lightening*, is, in the Hand of Nature, what Electricity is in our Hands. The Wonders which we now exhibit, at Pleasure, are only diminutive Imitations of those great and dreadful Effects of Thunder and Lightening, which frighten Mankind. A Cloud prepared by the Action of Winds, from Heat, from a Mixture of *Exhalations*, &c. is the electrified Body; and watery Clouds, or terrestrial Matter, are the *Non-Electrics* which excite it. — *Quam magnificata sunt Opera tua, Domine! Omnia in Sapientia fecisti!*

VI. QUERE 268, answered by the same.

A Scent, or Smell, with Regard to the Organs of Smelling, is an Impression made on the *Olfactory Nerves*, by minute Particles continually exhaling from odorous Bodies; consequently, such continual Exhalations must diminish the Substance from whence they arise.

Mr.

Mr. Dutton, late of Kingsley, but now of Northwich, Cheshire,

OBSERVES, that this *odoriferous* and other Waste, from the Perspiration of living vegetable and animal Bodies, is supplied by fresh Nutriment, proper to each Body; but does not discover how the *Effluvia* from dead or inanimate Bodies are supplied; *Musk, Asafœtida, Camphire, &c.* are supposed to exhale themselves, in Time, into no Substance, or only into a *Gas ut mortuum*, or inert Matter. — Though the Sun is supposed to suffer no Waste, or Diminution, from continual and copious Exhalation of his subtle Effluvia, or minute Parts; as continually supplied, to prevent a Defect in the solar System of Bodies.

Pal. Au.

VII. QUERE 269, answered by Mr. W. Turner.

AS there is a great Quantity of Air contained in all solid Bodies, and as Air is subject to expand by Heat, and condense by Cold; consequently the Length of a Pendulum will vary according to the different Degrees of Expansion and Condensation from Heat and Cold, in which it is placed.

VIII. QUERE 270, answered by the same.

IT is remarkable, (says Mr. Emerson, in his *Scientific System of Astronomy*.) that, through the best *Telescopes*, a fixed Star appears like a *lucid Point* without any Magnitude. This shews at what an amazing Distance the nearest fixed Stars are placed from our Earth. Their *Sparkling* or *Scintillation* appearing to our Sight, is also a Proof of their Minuteness; for, a Pencil of Rays, coming from a Star, is so very small, that any small Particle of the Atmosphere will stop it, or turn it out of the Way; which is the true Cause of *Sparkling* or *Scintillation*. The Scintillation of a Diamond may be accounted for by its vivid Splendour, and the Brightness of its Reflexions and Refractions.

IX. QUERE 271, answered by the same.

DR. Knight, in his *Treatise on Attraction and Repulsion*, gives it, as his Opinion, that the Earth may be considered as a great *Load-Stone*, whose magnetical Parts are disposed in a very irregular Manner; and that the *South Pole* of the Earth is analogous to the *North Pole* in Magnets; that is, the Pole by which the magnetical Stream enters. He likewise observes, that the Earth might become magnetical by the *Iron Ores* it contains. This Gentleman also imagines it possible that the Earth's *Magnetism* has been improving since the Creation; and this may be one Reason why the Use of the Compass was not discovered sooner. The Variation of the Declination and Inclination of the *Needle*, in the same Place, is still variable, and subject to no regular Computation. What the Quantity of both Sorts of magnetical Variation is, in the several Parts of the World, may be seen in Dr. Halley's Map of the World, improved from the Observations of Mr. Pound.

X. QUERE 272, answered by the same.

SOUND is a Perception of the Soul, communicated by Means of the Ear, or the Effect of a *Collision* of Bodies, and a *tremulous* Motion impressed on the Air, consequent thereon, communicated from the Collision to the *circumambient* Fluid, and propagated through it to the Organ of Hearing. The Sound of a Bell, therefore, consists of a vibratory Motion of its Parts, much like that of a musical Chord: The Stroke of the *Clapper* must necessarily change the Figure of the *Bell*, and, of a round, make it an oval, Form. But the Metal, having a great Degree of Elasticity, that Part will return back again after the Stroke that drove it farthest off from the Center, and that even

even some small Distance nearer the Center than before. So that the two Parts, which before were Extremes of the *longest Diameter*, do then become those of the *shortest*; and thus the *external Surface* of the Bell undergoes alternate Changes of Figure; and, by that Means, communicates that *tremulous Motion* to the Air in which the Sound consists; and the Distance it may be heard will be according to the *Intensity* of the percussive Force.

XI. QUERE 274, answered by the same.

WE have on this Subject (says an admired Writer) no other Guide than the *Holy Scriptures*; and we need only read them attentively for the Explanation of the philosophical Attainments of the first Inhabitants of this our Globe. Man came from the Hands of his *Creator* endued, not only with an intelligent *Soul*, but impressed also with a Sense of his own *Obligations* to the *Supreme Being*. He received the Gift of Speech by Inspiration, without which, being inferior in bodily Qualities to other Animals, he must have lived in *Want*, *Solitude*, and *Insecurity*. From whence it may be discovered that *God* afterwards communicated his *Will* by Words, and not by Intuition. In Process of Time the Limits of the Mind were extended; and the *first Language* of Mankind, of which we are now ignorant, increased in Proportion as the Men, who spoke it, became acquainted with a greater *Variety* of the Objects around them. This is all we can learn concerning the State of Mankind before that Period in which they were overwhelmed by the Flood. It is probable that the long Lives of the first *Patriarchs* gave them an Opportunity of making many Observations, and of practising several *Inventions*; but of these no *Vestiges* now remain. All that can be now asserted of their Acquirements is either the Product of *Conjecture* or of barefaced *Imposition*.

XII. QUERE 275, answered by the same.

THAT the first Song, of the first Species of Singing-Birds, was derived from Instinct, does not, I think, admit of a Doubt.

XIII. QUERE 276, answered by the same.

A Nestling Singing Bird, taken from its Parents, very young, and brought up within Hearing of different Kinds of Singing Birds, would, most certainly, acquire a *Confusion of Notes* in its Song.

XIV. QUERE 277, answered by the same.

I should imagine it would sing with the Parent Notes; though, perhaps, not so *correctly* as if it had been longer under the Tuition of its Parent.

XV. QUERE 278, answered by the same.

M. de Buffon says, that it is from no *organical Defect* Animals are denied the *Gift of Speech*; for we know several *Species* of them which may be taught to pronounce Words, and even repeat *Sentences* of some Length; such as the *Parrot*, *Jay*, *Pie*, *Mag-pie*, &c. Perhaps, were we to take the Trouble to teach them, many Others might be found capable of articulating particular *Sounds*:* But, to make them conceive the *Idea* which such Sounds denote, is an impracticable Task. They seem to repeat, and even to articulate, Sounds, merely as an *Echo*, or as an artificial Machine would repeat, or articulate. It is not in the mechanical Powers, or the material *Organs*, but in the *intellectual Faculty*, and in Thought, that they are deficient.

XVI.

* Leibnitz mentions a Dog which has been taught to pronounce several German and French Words.

XVI. QUERE 279, answered by the same.

THE Song of the same Species of Singing Birds will be varied by being educated amongst different *Songsters*.

XVII. QUERE 280, answered by the same.

FOR a more particular Solution to this *Quere*, than the narrow Limits of the *Palladium* will allow of, I refer the inquisitive Reader to the Perusal of a well-written Novel, under the Title of the *Man of Nature*; wherein he will find an ample Field for Speculation.

XVIII. QUERE 281, answered by the same.

I judge it to be more eligible to part from the *Sight* in *Infancy* than at *mature Age*; because a *Sense* so little enjoyed would be soon forgot; and the *Loss* of that we have no *Idea* of cannot produce, in us, the least *Uneasiness*; and, because, I think, the *Mind* of a blind *Man* is greatly assisted and enlarged by accustoming himself to think and reason under such *Circumstances*; who, finding few other *Amusements* but in the Pursuit of *Truth*, will be more likely to excel in *abstract Sciences*.

ANSWERS to the REBUSES in last Year's PALLADIUM.

I. NEWS.	V. FREAK,	VIII. BURFORD.
II. MINIM.	VI. REDDISH, SMITH, and	IX. POPE.
III. MAYO.	ROSS, Players.	X. HAUTBOY.
IV. Miss DIXON.	VII. WITNEY.	

An Answer to all the REBUSES, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

NEWS! NEWS! Mr. MINIM, Miss MAYO is marry'd 1, 2, 3.
 To young Johnny DIXON,* for whom she has tarry'd; 4.
 SMITH, REDDISH, and ROSS, at the Wedding attended, 6.
 And carol'd and jok'd till the Festival ended;
 Each Ear was saluted with HAUTBOYS and Fiddles, 10.
 And Turner, of WITNEY, propounded some Riddles; 7.
 Mr. BURFORD, the Author of *Cblæ* and *Thyrstis*, 8.
 Rehears'd some of POPE's energetical Verses, 9.
 In short, all the Day was a Scene of Delight,
 And Pleasures, ineffable, fill'd up the NIGHT! Prize-Ænigma.

* Forsaking poor Billy Swift, of Stow, her first Lover.

All the REBUSES answered by Mr. Francis Turner, of Lechdale, Gloucestershire.

1. The first of your Rebuses answers to NEWS;
2. The next is a MINIM, if Music you choose;
3. Miss MAYO the third, at her Toilette and Glafs;
4. The fourth is Miss DIXON, a beautiful Lass!
5. The fifth a gay FREAK is, to pleasure you with;
6. The sixth shews the Worth of ROSS, REDDISH, and SMITH;
7. The seventh is WITNEY, politely express'd;
8. The eighth is fam'd BURFORD, not far in the West;
9. The

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9. The ninth is a POPE, so renown'd for the Bays;
 10. And the tenth is a HAUTBOY, your Spirits to raise!

Answer to all the REBUSES, by Mr. W. Swift, of Stow, rejoicing for the Recovery of his Bride.

I.

NOW the Spring again returns,	
My Love in MAYO's Bosom burns,	3.
While POPE inspires my Soul!	9.
DIXON does on the HAUTBOY play,	4, 10.
And MINIM steals the Soul away,	2.
While FREAK he tips the Bowl.	5.

II.

Let the Nymphs and Swains advance,	
Beat the Ground in festive Dance,	
At WITNEY or at BURFORD Town;	7, 8.
Exulting let our joy appear,	
And spread the NEWS my MAYO's here,	1.
And does my Pleasures crown!	

III.

Now Song and Dance are not in vain,	
My MAYO is return'd again,	
And Sorrow now is o'er;	
Like TURNER's ACTORS on the Stage,	6.
In splendor let us all engage,	
For MAYO I adore!	

The foregoing Rebuses were all answered in Verification by Mr. W. Turner, of Burford; also by Mr. J. Cotton, of Huntingdon; Mr. John Needham, of Hinckley, in Leicestershire; Mr. W. Swift, of Stow, near Lincoln; Mr. William Marsden, of Netherburst, on the Subject of taking Philadelphia by his Majesty's Forces. Mr. Robinson, of Biddick; and Mr. John Fletcher, of Halton, near Frodsham, answered all, except the 5th, in Prose; as did Mr. Thomas Swift, of Lamberhurst; Mr. William Richardson, of Buckworth; Mr. J. Gruby, Coventry. Mr. Alexander Rowe, and Mr. Jonathan France, answered them in Verification.

To the PALLADIUM-AUTHOR.

SIR,

I HOPE you will excuse my *Delay*, in sending the inclosed Productions: Nothing but unavoidable Business has been the Cause of it.

The *Palladium* is a Work I shall always endeavour to promote as much as in me lies: And its ingenious Author I shall ever have the highest Veneration for.

The *Muses' Library* is not yet published; nor do I think it ever will, though we have met with ample Encouragement from Men of the greatest Abilities.

I am, &c. ISAAC GUMLEY.

An Answer to all the ÆNIGMAS, by Mr. Isaac Gumley, Land-Surveyor, of Countesthorpe, Leicestershire.

The FAITHFUL MAID.

LAURA's a Maid of graceful Size,
 With rosy Cheeks and sparkling Eyes;
 In whom the Graces all combine,
 And all the heavenly Virtues shine.

Unlike

Unlike those Nymphs, of fickle Mind,
 That turn and change with ev'ry WIND ; 8.
 Who rove about to gather NEWS, 7.
 And wed from interested Views ;
 Who spend the sweetest Days of Life
 In Nonsense, Noise, and needful Strife.
 She emulates the Saints above
 In virtuous Deeds, and faithful Love :
 Nor would she e'er, to gain a Nation,
 Injure a Neighbour's Reputation.
 To hear her speak, and see her move,
 Would fire an Hermit's Heart with Love ;
 No Wonder then that youthful Swains
 Adore the Nymph, and tell their Pains :
 That each implores the *Paphian* Throne,
 To call the charming Maid his own.
 Young *John*, who featly guides the PLOUGH, 1.
 And threshes out the Barley-Mow,
 Makes her all Day his chief Delight,
 And talks of Nought but her at NIGHT, Prize,
 But, rustic *John*, bid Love adieu,
 For *LAURA*'s ne'er a Heart for you.
 Tall *Sim*, the Baker, deeply sighs, }
 So smit by *LAURA*'s piercing Eyes,
 He spoils his Puddings, Cakes, and Pies. }
 At Times, in Fit, he leaves his BED, 2.
 Then heats his OVEN, burns his Bread. 6.
 Whene'er he strives to tell his Tale,
 His Tongue is ty'd, and Spirits fail ;
 At humble Distance, lo ! he stands,
 With fixed Eyes, and folded Hands :
 Each Attitude his Care reveals,
 And Sighs declare the Pangs he feels ;
 At length his Tongue begins to move,
 And falters out, " 'Tis thou I love."
 But, *Sim*, this hopeless Task decline,
 For *LAURA* never must be thine.
 Old *Gripus*, well assur'd to win,
 With stutt'ring Voice, and stupid Grin,
 Comes forward, holding up his Breeches,
 And talks, — and talks of Nought but Riches.
 He tells her Love will disappoint her,
 Unless it's added to a Jointure ;
 That Wealth, alone, our Bliss secures,
 And will as long as Life endures :
 That those, which fail t'increase their Store,
 Are stupid Fools, and NOTHING more. 3.
 O may their mutual Joys increase,
 And all their Days be blest with Peace !
 My Dear, says he, if you'd be wise,
 And into Estimation rise,
 Oh ! come, (all charming as thou art,)
 And give to me thy Hand and Heart ;
 For, when thy Beauties I behold,
 I love you more than all my Gold,

Now, *LAURA*, with my Wish comply,
 And all is your's whene'er I die.
 O, foolish Wretch ! thy Suit decline,
 For *LAURA* never must be thine.
 By you, nor *Sim*, nor Ploughman *John*,
 Fair *LAURA*'s Heart will e'er be won ;
 On *Strephon* only will she fix,
 For whom she'd scorn a Coach and fix.
 With all the Glare that charms the Proud,
 And sets agape the vulgar Croud.
 Full well she knows that real Joy,
 Nor Gold, nor sparkling Gems, can buy :
 Nor would she deign with you to live,
 For all the Wealth the World can give.
 Not all the Swains that fondly gaze,
 And fill the Air with *LAURA*'s Praise ;
 Not all the Nymphs with Envy fill'd,
 In Falsehood and Detraction skill'd ;
 Nor Friends, with Threats, or soothing Art,
 Can move young *Strephon* from her Heart.
 And who can justly blame the Fair ?
 For he deserves her utmost Care :
 For her he'd face a Tyrant's Frowns,
 And scorn his Wealth and splendid Crowns,
 His princely Pomp, and plunder'd Towns. }
 When first the youthful Maid he saw, }
 His Mind was fill'd with Love and Awe ; }
 To guard his Heart, in vain he tries,
 Against her sweet bewitching Eyes ;
 For, from those Eyes, a single Glance
 Can conquer more than Sword or Lance :
 Can make the most obdurate yield,
 And boasted Reason quit the Field.
 Yet, though with all those Charms endu'd, }
 Which ever have the Soul subdu'd,
 She scorns the Actions of a Prude ;
 For o'er her tender Love prevails,
 And Sense and Pity turn the Scales.
 His Suit with modest Joy she hears,
 And soon disperses all his Fears ;
 Her condescending Smiles impart
 The sweetest Raptures to his Heart ;
 And each enjoys the rare Delight,
 That's found when kindred Souls unite ;
 Souls that with soft Sensations move,
 And glow with sympathetic Love.
 May *Hymen* crown their Wishes soon,
 And all their Days be HONEY-MOON ! } 9.

ANSWERS to the PARADOXES in last Year's PALLADIUM.

I. PARADOX answered by Mr. William Richardson, of Blackworth.

WRAP a Sheet of Writing-Paper round a cylindrical Piece of Wood, then fix one Point of a Pair of Compasses at the Surface, turning the other Point round,

round, with a Drawing-Pen fixed to it, till a complete Revolution is thereby performed on the cylindrical Surface. Remove the Paper, and you will see the Periphery of an *Ellipsis* exactly described.

Mr. Thomas Smith, of Lamberhurst, Kent, and Mr. Jonathan France, of Hope-School, answered it in the same Manner.

II. PARADOX answered by Mr. Jonathan France.

THE Goods were bought by *Avoirdupoise* Weight, at 6d. per lb. and sold again at Troy Weight, at 5d. per Pound.

Put x = lbs. *Avoirdup.* bought, then, by last Year's *Pal.* $\frac{1215x}{1000}$ = lbs.

Troy. x lbs. *Avoirdup.* at 6d. per lb. cost $6x$, and $\frac{1215x}{1000}$ lb. Troy, at 5d.

per lb. cost $\frac{6075x}{1000}$ Pence; whence, $\frac{6075x}{1000} - 6x = (10l. \text{ Sterling}) = 2400$

Pence. Th. $x = 3200$ lbs. *Avoird.* Weight bought, and 3880 lbs. Troy Weight sold; whereby 10l. were gained.

Mr. Thomas Smith, of Lamberhurst, answered it in another Manner.

III. PARADOX answered by the Palladium-Author.

A Day, in the civil Account of Time, begins at twelve at Night, and ends the Day following at twelve at Night. But it is observable, by each Year's Table of the Moon's Southing, that *Morn* is printed in each Column of each Month of the Year; signifying that the Moon souths not on that Day, but souths the Day following in the Morning. For Instance, the Moon souths not on the 13th Day; because she southed on the 12th, at 11^h 57^m, at Night; and does not south again till the 14th Day, 0^h 55^m, in the Morning.

The same Circumstance, with Regard to the Moon's *not southing*, upon one certain Day in each Month, also happens in her *not rising* upon one particular Day of the same Month; and, likewise, in her *not setting* upon one particular Day of that Month, throughout all the Months of the Year; but rises and sets in the Morning of the Day following.

These three Circumstances of the Moon's *not rising*, *southing*, and *setting*, on three certain and respective Days, in each Month of the Year, are occasioned by there being above twenty-four solar Hours between *rising*, *southing*, and *setting*, of the Moon, on all Days; so that she *rises*, *souths*, and *sets*, on the three respective following Days, early in the Morning.

N. B. These three Circumstances, respecting the Moon's *not rising*, *southing*, and *setting*, on three respective Days in each Month of the Year, are worthy of Observation; though never noticed or explained by any of our Correspondents; yet is a Truth perfectly astronomical.

IV. PARADOX, answered by Mr. Alexander Rowe, of Reginnis, Cornwall.

A's Month must consist of twenty-eight Days,
And B's thirty-one, when each alike pays.*

* Difference of these two Months being six Days.

Mr. Jonathan France observes, that A lodged by the Calendar Month, containing thirty one Days each; and that B lodged by the common Month, containing

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 taining twenty-eight Days each; making just six Days *Difference*; whereby
 each Lodger paid the same.

V. PARADOX, answered by Juvenis.

FIRST, $1\frac{1}{2}$ Length, by 4 Breadths (of 1 Yard each) = 5 Sq. Yards,
 make a full sized outward Petticoat; and twice as much each, lined with 5
 Yards of square Flannel, will consequently make two *outward* Coats, e-
 qual to the whole Quantity of Flannel. The Purchase being made by the Ell,

(*English Measure*,) therefore, 2 Ells in Length = $\frac{10}{4}$ Yards, by 3 Breadths,

(of 1 Ell each, $\frac{5}{4}$ Y.) make 6 Ells *square* for both *outside* Coats, viz. $\frac{10}{4} \times \frac{15}{4}$

= $\frac{150}{16} = \frac{75}{8} = 9$ Yards $\frac{3}{8}$ for both Coats, ($\frac{5}{8}$ Yd. short of 10 sq. Yards,) or

$\frac{5}{4}$ Yrd. $\times \frac{15}{4} = \frac{75}{16} = 4\frac{11}{16}$ square Yards in each.

But, $1\frac{1}{4}$ Yard $\times 2\frac{1}{2}$ Yards (= $2\frac{1}{2}$ Breadth wide,) = $\frac{5}{4} \times \frac{5}{2} = \frac{25}{8} =$

$3\frac{1}{8}$ square Yards in 1 *Underlin*. The same, by the Flannel, $3\frac{1}{8}$ square Yards
 of Flannel make 2 *Underlins*. Five Yards of Flannel — $3\frac{1}{8}$ Yards, = $1\frac{7}{8}$
 Yards sq. Flannel left. Five Yards sq. — $3\frac{1}{8}$ Yards sq. Stuff, = $1\frac{7}{8}$ Yards of
 sq. Stuff left for one *outside* and two *Underlins*.

For Proof, { $4\frac{11}{16}$ square Yards, 1 outward Coat,
 $4\frac{11}{16}$ Flannel Lining.
 $3\frac{1}{8}$ 1 *Underlin*. } Without Lining,
 $3\frac{1}{8}$ 1 ditto of Flannel.
 $1\frac{7}{8}$ left of the first *Underlin*.
 $1\frac{7}{8}$ left of the Flannel *Underlin*,

Sum $19\frac{3}{8}$ square Yards, (including 10 square Yards of Flannel).

Instead of two outward Coats, of 5 square Yards each, both lined with 10 sq.
 Yards of Flannel.

VI. PARADOX, answered by Mr. Robert Tyrrell Heath.

BY P. 71, *Practical Arithmetician*, 18 Feet make a Pole in the Fens, and
 21 in the Forests. Hence a Person cannot ride the same Number of Poles an
 Hour in the Forests, that he can ride in the Fens; supposing the Roads in
 both to be equally passable.

In the Fens he could ride 5 Miles an Hour, at $16\frac{1}{2}$ Feet to a Pole. — *Inversely*.

As $16\frac{1}{2}$ F. : 5 M :: 18 F. : $4M\frac{7}{12}$ an Hour, in the Fens.

As ————— : 21 F. : $3M\frac{13}{14}$ an Hour, in the Forests.

Or,

Or, 1600 common Poles = 264000 Feet, \div 5760 *Fen-Feet* in 1 M. quotes in $4M\frac{7}{12}$ in an Hour. Or \div 6720 *Forest-Feet* in 1 Mile, quotes $3M\frac{13}{14}$ in an Hour, as before.

Written by a Gentleman who had an untoward Wife.

MOTTO.

"He that is robb'd, not knowing what is stolen,
"Let him not know't, and be's not robb'd at all."

Poor Adam's crooked Rib was made the first,
Whose Dealing with the D---l Mankind accurst;
Successive crooked Ribs their Charter plead,
And still, to curse poor Man, keep up the Trade.

ANSWERS to the QUESTIONS in last Year's PALLADIUM.

I. QUESTION 607, answered by Mr. Robert Tyrrell Heath.

SUPPOSE 100 Stones placed one Yard asunder, to be gathered singly, by one Person, and placed, in a Heap, at the first Stone. Hence, the Number of Stones, and Yards travelled over by the Gatherer, in taking up each Stone, will be as follow:

Heap.

1. 2, 3, 4, 5, &c. Number of Stones to be picked up singly.

2. 2, 4, 6, 8, &c. Yards travelled in picking up each Stone.

3. 2, 6, 12, 20, &c. Yards travelled in placing all the Stones at the first.

Hence, it is observable, that the Number of Yards travelled in all, by placing all the Stones, at any Stone's Place, as at the first Stone, will be *exactly* equal to the Number of any Stones, being placed one Yard from each other, multiplied into one less than the Number of any Stone's Place. AN UNIVERSAL RULE.

In the foregoing Case, multiplying 100 Stones by 99, one less than that Number, the Product = 9900 Yards = 5 Miles, 5 Furlongs, travelled by one Person, picking up 100 Stones singly, and placing them in one Heap at the first Stone.

In the present Case, let x = Number of Stones, then will $x \times x - 1 = xx - x = 21120$ Yards in 12 Miles, or nearest Number to it. Completing the Square, $xx - x + \frac{1}{4} = 21120 + \frac{1}{4}$; by Extraction and Transposition, $x =$

$\sqrt{21120.25} : + .5$, where $x = 145.828$, &c. the Number of Stones, to which the nearest Number, = 146 Stones, the correct Answer. W. W. R.

Stones.

Stones.

N.B. $145 \times 144 = 20880$, Yards travelled.
 21120 , Yards in 12 M.

$146 \times 145 = 21170$, Y. travell.
 21120 , Y. in 12 M.

Miles, Travelled 240 Yards under 12

Travelled 50 Ya. above
12 Miles; being the nearest
Distance to 12 Miles.

Mr.

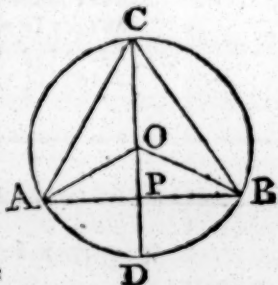
Mr. Joseph James, Master of Stoke-Bishop Academy, near Bristol, gave a correct Answer as above; as did Mr. Francis Turner, of Leckdale, Gloucestershire; Mr. John Cartill, of Walkington, near Hull; Mr. William Burke, of Swanland, near Hull; Mr. W. Penn, of Chalfont, Bucks; Mr. W. Sherwin, of Aston-upon-Trent; Mr. John Fletcher, of Halton, near Frodsham; Mr. J. Gruby, Coventry, Warwickshire; Mr. Thomas Robinson, of Biddick; but, in general, our Correspondents, like Mr. Saunders, of Cottingham, not considering the nearest Distance above or below 12 Miles, and not proving their Conclusions as above, determined the Number of Stones to be 145, instead of 146, the true Number. Mr. Richard Batbo determined the true Number; as did Mr. Alex. Rowe, of Cornwall; Mr. Barrow; and Mr. J. Gedney, of Wyton.

II. QUESTION 608, answered by Mr. Joseph Mouldale.

ABOUT the given equilateral Triangle ABC, describe a Circle. Draw AO, BO, to the Center O, then is $PO = \frac{1}{2} BO = PD$; for $\angle POB = 2 \angle PCB = 2 \angle PBO = 60^\circ$; therefore, $PO = PD = \frac{1}{2} BO$,

and $PB = PO \times \sqrt{3}$. Conseq. $PO^2 \times \sqrt{3} =$

$AOB = \frac{103}{3}$ (as per Qu.) Whence, $PO =$



4.4522, $BO = 8.9044$. But $BO^2 \times 3.1416 =$

249.0 = Area Circle, and $BO^2 \times 3.1416 = 48\frac{2}{3}$ Area of each Segment. W.W.R.

Corollary. If, about any equilateral Triangle, a Circle be described, then one-third of that Triangle is to the Area of one of the Segments, as 12 to 17,

nearly: For, $\frac{103}{13} = 34\frac{1}{13}$; and $12 : 17 :: 34\frac{1}{13} : 48.6388$, nearly, $= 48\frac{2}{3}$.

Mr. John Fletcher, of Halton, near Frodsham, answered it in the same concise and correct Manner; as did Mr. Robert Wilkinson, at Mr. Clark's School, at Newton, near Alnwick, Northumberland; Mr. William Hemingway, at Aughton; Mr. John Hardwick, of Whiston; Mr. J. Cartell, of Walkington, near Hull; Mr. Francis Turner, of Leckdale, Gloucestershire; Mr. Joseph James, Master of Stokes-Bishop Academy, near Bristol; Mr. William Burke, of Swanland, near Hull; Mr. Thomas Smith, of Lamberhurst, Kent; (from standing Numbers, deduced from the Side of an equilateral Triangle, $= 1$;) Mr. Geo. Reed, of Catcliff; Mr. W. Penn, of Chalfont, Bucks; Mr. W. Sherwin, of Aston, in Derbyshire; Mr. Lobster, of Tankerly Common Side, (who sent an unintelligible and awkward Name, near it, not fit for the Palladium); and Mr. J. Gruby, of Coventry. Mr. J. Gedney, solved it; as did Mr. Alex. Rowe, and Mr. Richard Batbo. Mr. Sanders, of Cottingham, answered it too late.

III. QUESTION 609, answered by Mr. Joseph James.

PUT $v = x^2 + y^2$, $w = xy$, then the given Equations become $v + w = a$, and $v^2 - 2w^2 + w^3 = b$. From the 1st of which, $v = a - w$, which sub. in the 2d, gives $a^2 - 2aw - w^2 + w^3 = b$, or $w^3 - w^2 - 98w = 1680$. Hence, $w = 15$, and $v = 34$. Now put $m = 34$, and $n = 15$, then $x^2 + y^2 = m$, and $xy = n$. To and from the 1st of these Equations, add and subtract twice the 2d, and the Sum and Difference will be $x^2 + 2xy + y^2 = m + 2n$; and $x^2 - 2xy + y^2 = m - 2n$, respectively. Hence, extracting the Square Roots, we have, by Reduction, x and $y = \frac{1}{2}$

$$\sqrt{m + 2n} + \frac{1}{2} \sqrt{m - 2n} = 5 \text{ and } 3.$$

W.W.R.

Mr.

Mr. Joseph Moulfdale's Solution.

PUT $x + y = s$, $xy = p$, then the given Equations become $s^2 - p = a$, and $x^4 + y^4 = b - p^3 = \overline{a - p^2} - 2p^2 = a^2 - 2ap - p^2$, and $p^3 - p^2 - 2ap = b - a^2 = 1680$, from whence $p = 15$, and $s = 8$ from above, $= x + y$, and $xy = 15$; therefore, $8 - y = \frac{15}{y}$; whence $y = 3$, $x = 5$, or $x = 3$, and $y = 5$. W.W.R.

Mr. *Burke*, by a similar Substitution, determines the same Numbers. Mr. *Robert Wilkinſon* determines the same Numbers by *Trial and Error*, from a Similitude of both Parts of each Equation, where x and y are ſeen to have interchangeable Values. Mr. *W. Sherwin*, by a ſimilar Subſtitution to that in Mr. *James's* Solution, determines the ſame Concluſions very conciſely; Mr. *Robiſon*, by a *bigb* complicated Equation, with Surds, ſolved by *Trial and Error*, gives the true Answer; Mr. *Thomas Barrow*, of *Welton School*, near *Hull*, ſolved it; as did Mr. *Alexander Rowe*.

Mr. John Cartill's metbedical Solution.

Given	$\left\{ \begin{array}{l} 1. x^2 + xy + y^2 = a = 49. \\ 2. x^4 + x^3y^3 + y^4 = b = 4081. \end{array} \right\}$	Required the Values of x and y .	
1. tranſp.			$3. x^2 + y^2 = a - xy.$
3. ③			$4. x^4 + 2x^2y^2 + y^4 = a^2 - 2axy + x^2y^2.$
4. contract.			$5. x^4 + x^2y^2 + y^4 = a^2 - 2axy.$ [Equation.
2 - 5			$6. x^3y^3 - x^2y^2 - 2axy = b - a^2$; here xy is found by a cubic
viz.			$7. xy = 15.$
1 + 7			$8. x^2 + 2xy + y^2 = 64.$
8. utw 2			$9. x + y = 8.$
7 X 3			$10. 3xy = 45.$
1 - 10			$11. x^2 - 2xy + y^2 = 4.$
11. utw 2			$12. x - y = 2.$
12 + 9			$13. x = 5$, and $y = 3$, or $y = 5$, and $x = 3$. W.W.R.

Mr. *Sanders*, of *Cottingham*, answered it too late for Inſertion.

IV. QUESTION 610, (by *Amelia*, of *Derbyſhire*.)

OUR Correspondents do not meddle with this Queſtion.

Mr. *Sherwin* propoſes a Solution, by altering Equations, as follow :

He puts $\overline{x^4 - x^2}^2 + \overline{x^2 + x}^2 + \overline{x^2 - 1}^2 - 2x^2 - x^7 = x^3$. \div $x^2 - 1$, then $x^6 - x^5 - x^4 + 2x^2 - 1 = 0$; \div this Equation by x^4

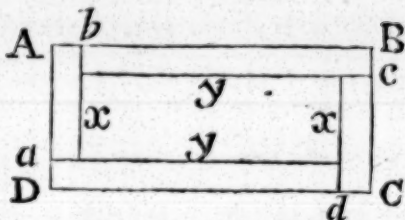
$-x + 1$; then, $x^2 - x - 1 = 0$. Whence $x = \sqrt{+\frac{1}{4} : +\frac{1}{2}} = 1.61803399$, &c. N.B. Unleſs a *Goron* and *Caffock* can ſolve the original Equations, by a Quadratic, this Solution may be admitted.

Mr. *Alexander Rowe*, however, has untied the *Gordian Knot*, who puts

$\overline{x^2 - x}^2$ inſtead of $\overline{x^2 + 1}^2$ printed; then, by *Qu.* $x^7 = 3x^3$; therefore, $x^4 = \sqrt[3]{3}$, $x^2 = \sqrt{\sqrt[3]{3}} = 1.316$. W.W.R.

V. QUESTION 611, considered by the Palladium-Author.

LET ABCD represent the outside Walls of the *rectangular* Building; and let the 4 Spaces, $a A b$, $b B c$, $c C d$, $d D a$, represent the Area of the Walls Base; where the Space, $a A b$, $= c C d$; and $b B c = d D a$; and, putting x = the Breadth of the inner Room, y = its Length, and z = the Height of the Walls: Then, as the Thickness of the Walls, every-



where, $= 15$ Inches, and $a A + b B + c C + d D =$ Length of the Walls,

as if one straight Wall. Th. $\overline{x + 15} + \overline{x + 15} + \overline{y + 15} + \overline{y + 15} =$

that Length $= \overline{x + 15} \times 2 + \overline{y + 15} \times 2$; which, multiplied by 15 In-

ches, the Wall's Thickness, $= \overline{x + 15} \times 2 + \overline{y + 15} \times 2, \times 15 =$ the

Area of the Walls Base; which, multiplied into z , their Height, $\overline{x + 15}$

$\times 2 \times 15 \times z, + \overline{y + 15} \times 2, \times 15 \times z =$ the Wall's Solidity $= 9 \times 3 \times 1\frac{1}{2}$ (Solidity of 1 Brick) $\times 100000 = 4050000$ solid Inches. Whence,

$\overline{x + 15} \times 30 z, + \overline{y + 15} \times 30 z = 405000$. That is (dividing by 30) $\overline{x + 15} \times z + \overline{y + 15} \times z = 135000$ solid Inches $= a$; and xyz , the Solidity of the Room, a Maximum.

By the former of these Equations, $z = \frac{a}{x + y + b}$ (where $b = 30$;))

whence, $\frac{axy}{x + y + b} =$ a Maximum, or (dividing by a) $\frac{xy}{x + y + b} =$ a

Maximum; which, it is evident, must be when x and y are infinitely great. For, (to shew the Inconsistency of such a Maximum,) in Fluxions, $xy + y\dot{x} \times$

$\overline{x + y + b}$ minus $\dot{x} + \dot{y} \times xy = 0$. That is, $x^2\dot{y} + xy\dot{x} + yx\dot{y} + y^2\dot{x} + bxy\dot{x} + by\dot{x} - xy\dot{x} - xy\dot{y} = 0$. And (making the homologous Terms $= 0$) $x^2\dot{y} + yx\dot{y} + bx\dot{y} - xy\dot{y} = 0$, } Whence, $x^2 + yx + bx - xy = 0$.
Here $xx + bx = 0$.

and $xy\dot{x} + y^2\dot{x} + by\dot{x} - xy\dot{x} = 0$. } And $xy + y^2 + by - xy = 0$.
Here $y^2 + by = 0$.

Th. $x + b = 0$, and $y + b = 0$, an Impossibility. Consequently, the Conditions of this Question admit of no Maximum; because an impossible Equation resulting from the Operation will not admit of any; which was to be proved.

Some Correspondents made the Sides of the Room and its Height alike; Others made the Length and Breadth equal, and the Height the Half of each, and so deduced erroneous Conclusions.

When the Sides and Height are alike, they come out (without allowing for Mortar) $= 252.4158$ Inches $= 21.034$ Feet $= 7.01155$ Yards. Whence the Room's Solidity $= 9306$ Feet, nearly. When the Length and Breadth are alike, and the Height of the Room the Half of each, they come out 176.25 Inches, exactly, $= 14.6875$ Feet; and 14.6875 Feet, the Height; whence, the Room's solid Content $= 12673.70650546785$ cubic Feet, precisely, a much

much greater Content than 9306 Feet, when the Breadth, Length, and Height, are alike.

One Correspondent, making the Height and Breadth alike, and assuming the Length = x , from $\overline{x + y} \times y \times 15 \times 2 = 4050000$ cubic Inches of the Bricks, determines $\overline{x + y} \times y = a = \frac{4050000}{30} = 135000$ In.; whence,

he finds, $\frac{a - y^2}{y} = x$; and, by *Question*, $\frac{a - y^2}{y} \times y \times y = ay - y^3$ is

(erroneously) a *Maximum*. So that, by Fluxions (erroneously) $y = \sqrt[3]{\frac{a}{3}} =$

212.132034 In. = 17.677669 Feet = the Breadth and Height: And the Length, therefore, = 424.264068 In. = 35.3559 Feet; and his *Maximum* is far less than that with the Length and Breadth equal and Height the Half of each.

All Answers sent were wrong Solutions; and therefore we recommend to our Correspondents their more serious Attention to scientific Truth, to save themselves and us Trouble, in making Corrections.

By making the Sides and the Length of the Room equal, $a A = c C$ (see Fig.) = $\overline{x} \times 15 \times 2$; $b B = d D = \overline{x + 15} \times 2$; whence, $\overline{x + 15} \times 4 =$ the Walls Length, whose Area, at the Base, $\overline{x + 15} \times 4 \times 15$; and Solidity = $\overline{x + 15} \times 4 \times 15 \times x = 4050000$ cubic Inches. Whence, $xx + 15x = \frac{4050000}{30}$. Solved $x = 252.4158$ In. as before. When $2x =$

Length = Breadth, and $x =$ Height, then $2x + 15 \times 4 \times 15 \times x = 4050000$ Cub. In. Whence, $x^2 + 7.5x = 4050000 \div 120$; solved $x = 176.25$ In. exactly, = 14.6875 Feet, the Room's Height, whence its Length and Breadth 20.375 Feet, as before.

Hence it appears that the lower the Room is, in Respect of the Length and Breadth, being equal, the greater will be its Solidity, built with 100000 Bricks of the given Dimensions, to break the fewest. Which Circumstances ought to be considered for building a House the most advantageous as well as capacious. Both which Circumstances our Correspondents (not being bred Bricklayers) never took into Consideration. For, by laying 2 Bricks abreast, in the fore Part of the Wall, and 3 endways behind them, the Wall will have its due Thickness, of 15 Inches, everywhere; and no Bricks broken in the Space, = 135 square Inches, taken up by 5 Bricks so laid on, together at one Time; which will suggest a new and consistent Method of Solution.

The Mortar will add proportionally to the Height, Length, and Breadth, of the Building, and make more inside Room, for the Accommodation of the Dwellers; but this Increase of Room will again be reduced by the inside Wainscoting and Plastering.

Since, $\overline{x + 15} \times 4 = 4$ Walls Length, (as one Wall,) built with a square Base; consequently $\overline{x + 15} \times 4 \times 15$ sq. In. (Thickness,) = Area of the Wall's Base; which multiplied by b , their Height, = $\overline{x + 15} \times 4 \times 15$
F 2 x b

$x \times b = 4050000$ cubic In. whence we get $b = \frac{67500}{x+15}$ and $\frac{67500}{x+15 \times 1\frac{1}{2}}$

$= \frac{45000}{x+15} = \text{Number of Courses of Bricks} = \text{a whole Number. Hence,}$

x may $= 235$ In. whence the Number of Courses $= 180$, and the Wall's Height $b, = 270$ Inches. Hence the Wall's Length $= 1000$ Inches, on a square Base; Area of its Base 15000 sq. In. multiplied by 270 Inches, its Height, $= 4050000$ cubic Inches. *Proof.*

But, to break the fewest Bricks, the Area of the Base divided by 135 In. the sq. Inches in 5 Bricks, laid on as aforesaid, in rectangular Spaces, should be a whole Number, $=$ Number of 5 Brick Spaces; and also the Number of Courses should be a whole Number; so that the Builder may exactly expend 1000000 whole Bricks, of the given Dimensions, without breaking any.

Hence, $\frac{x+15 \times 4 \times 15 \text{ Area of Wall's Base}}{135 \text{ square Inches in } 5 \text{ Bricks.}}$, should be a whole Num-

ber, $=$ Number of 5 Brick Spaces; and $\frac{45000}{x+15} = \text{Number of Courses}$, should be a whole Number.

By the first, $\frac{x+15}{9} = \text{a whole Number} = m$; whence $x = 9m - 15$, a

whole Number, which, put in the second Expression, $\frac{4500}{9m}$, a whole Number,

$\frac{500}{m}$ will be a whole Number $=$ Number of Courses of Bricks, may $=$

125 , when $m = 4$, Side of Room's sq. Base; consequently, x may $= 345$ In.

then 21600 In. $=$ Area of 4 Walls Base; and $\frac{21600}{135} = 160$, Number of

5 Bricks Spaces; and b , the Height of the Walls, $= 187.5$ Inches.

Now, 187.5 In. Height $\times 21600$ In. Area at Base $= 4050000$ cubic In. $160 \times 5 = 800$ Bricks, in the 4 Walls Base in 1 Course, multiplied by $9 \times 3 \times 1\frac{1}{2}$, cubic In. in 1 Brick, $= 32400$ cubic Inches in 1 Course of Bricks; multiplied by 125 Courses $= 4050000$ cubic In. as before. *Proof.*

N. B. $345 \times 345 \times 187.5$ In. $= 22317187.5$ In. $= 12915039$ cubic Feet, the rectangular Room's Content; much greater than 12673.7 cubic Feet, by Mr. W. Moulsdale, the greatest Maximum of any sent us.—Mr. Sanders, of Cottingham, near Hull, was out of his Latitude, in July.

☞ A Correspondent would be glad to know, of Mr. Dutton, for what Use he intends his House, as he has allowed for neither Door-Spaces nor Windows; being unfit for a common Prison, only open at Top. Whether for wild Fowls to lodge in at Night?

We supplied the Numbers to this Question, he seldom engages with.

VI. QUESTION 612, answered by Mr. John Cartill, of Walkinton, near Hull.

BY the Table, in the Royal Astronomer, P. 182, last Line, the Year is found 1800, answering all the Conditions of the Question. But the same may be investigated by a Method shewn in the said Royal Astronomer, which is universal in answering all such Questions,

Mr,

Mr. Joseph James answered it; as did Mr. Robinson, Mr. Fletcher, Mr. Burke, Mr. W. Sberwin, Mr. Francis Turner, Mr. Alex. Rowe, Mr. Thomas Barrow, of Welton School. Mr. Saunders, of Cottingham, sent a late Answer.

VII. QUESTION 613, answered by Mr. John Fletcher.

IT is demonstrated by the Writers on Gunnery, which Rules are applicable to Archery, that the greatest Amplitude of a Ball, shot from a Piece of Ordnance, is double the Height of its perpendicular Flight. Consequently, the Boy, who can shoot an Arrow 100 Yards perpendicularly, can shoot the same Arrow 200 Yards, in a Direction of 45° Degrees with the Horizon; being the Angle of the greatest Random.

Mr. Thomas Robinson solved the same by a correct Process and Fluxions. Mr. Mouldale, by the Curve of a Parabola, and by the Principles of Gunnery geometrically delineated, has accurately solved the same, and given a curious geometrical Demonstration of the greatest Random, at 45° Degrees Elevation; it being double the perpendicular Flight of a Projection; concluding with this useful

Corollary. It is proved, by Experiment, that a Projectile, in its Flight, on Account of the Air's Resistance, does not describe a Parabola, but nearer the Curve of an Hyperbola; whence, this Theory gives the horizontal Random too much by about $\frac{1}{4}$ of the Random, or of the greatest parabolic Ordinate, as Sir Isaac Newton has shewn from the Theory.

Mr. W. Sberwin answered the same; as did Mr. Cartill, scientifically. Mr. G. Reed, of Catcliff, gave the Angle of Elevation. Mr. Dutton also solved it in a right Number. Mr. Sanders, of Hull, hit the Mark late in July.

VIII. QUESTION 614, answered by Mr. Mouldale.

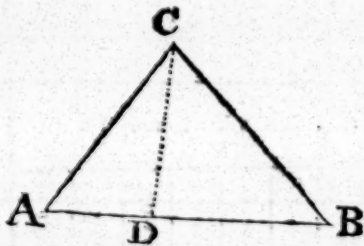
DIVIDE the given Area by Half the Base, which gives the Perpendicular, which put $= b$; the Base $AB = a$, Diff. of Sides $= d$, and Sum of the Sides $= x$;

then, $a : x :: d : \frac{dx}{a} = \text{Diff. Segments}$

of the Base; but $\overline{DB}^2 + \overline{DC}^2 = \overline{CB}^2$ that is, $\frac{a^4 + 2a^2dx + d^2x^2}{4a^2} + b^2 =$

$$= \frac{x^2 + 2dx + d^2}{4}. \text{ Solved } x = a \sqrt{\frac{a^2 + 4b^2 - d^2}{a^2 - d^2}}. \quad \text{W.W.R.}$$

See the Construction, P. 395, in Simpson's Algebra.



Mr. John Cartill, putting $a = \text{Area of the Base}$, $b = \text{Base}$, $d = \text{Diff. of Legs}$; whence the Perpend. $= \frac{2x}{b} = p$, lesser Leg $= x$, greater $= x + d$.

By Trigon. $b : 2x :: d : \frac{2dx + dd}{b} = \text{Diff. Seg. Base}$. Th. $\frac{b^2 - 2dx - dd}{2b}$
 $= \text{lesser Segment}$. Let $b^2 - d^2 = m$, then (by 47. c. 1.) $\frac{m - 2dx}{2b}^2 + p^2 = x^2$.

$$= x^2. \text{ Solved } x = \sqrt{\frac{4a^2}{b^2-d^2} + \frac{b^2}{4}} : + \frac{d}{2} \text{ universally. W.W.R.}$$

Mr. *W. Sherwin* also solved it analytically and correctly ; as did Mr. *W. Hemingway* ; both determining $x = \sqrt{\frac{b^4 + 16a^2 - d^2b^2}{b^2 - d^2}}$; both putting a = Area, b = the Base, d = Diff. Legs, and = Sum of the Legs, confirming each other's Solution.

Mr. *Robinson* also solved it analytically, by two short Expressions of the greater and lesser Side $= \frac{d+b}{2} \sqrt{\frac{1+4c^2}{b^2-4d^2}}$ and $\frac{b}{2} \sqrt{\frac{1+c^2}{b^2-4d^2}}$, respectively. He puts $\frac{2 \times \text{Area}}{\text{Base}} = \text{Perp.} = c$; $2x$ = Sum Sides, $2d$ = Diff. x

+ d = greater Side, b = Base, and so proceeds to his Conclusions.

Mr. *Sherwin* refers to P 395, in *Simpson's Algebra*, for the general Construction and Answer. Mr. *Joseph James* gave a curious analytical Solution ; and refers to the said *Algebra* for a Construct n.

Mr. *John Hardwicke* elegantly solved this Question, exactly similar with Mr. *Cartill's* Solution ; as did Mr. *George Reed* and Mr. *W. Burke*. Mr. *Alex. Rowe* puts a = Area, b = Half the Base, and $d = \frac{1}{2}$ Diff. Sides, $x = \frac{1}{2}$ Sum Sides, and comes to this elegant Conclusion, $x = \sqrt{\frac{a^2 + b^2 - b^2d^2}{b^2 - d^2}}$. Mr.

Thomas Barrow, of *Welton School*, near *Hull*, solved it ; as did Mr. *Sanders*, of *Cottingham*.

IX. QUESTION 615, answered by Mr. *Joseph James*, who gives the following Tables of the Cases.

CASE I. and II.						
Sixes.	Fives.	Fours.	Threes.	Twos.	Ones.	Game.
1	3	1	1	1	1	31
1	2	2	1	1	2	31
1		1	2	2	1	31
1	4	1	2	1	3	21
1	1	2	1	2	1	31
1	1	3	1	1	3	31
1	1	2	2	1	1	31
1	1	2	2	2	2	31
1	1	1	2	3	1	31
1	1	2	2	1	4	31
1	1	1	2	4	2	31
1	1	1	2	3	4	31

Table for Case II.

The Tables for the first and second Cases are continued no lower than where one of each Card is concerned ; otherwise its Extent would be too great and burthenome for Thought, or Memory.

The three last Lines where 4 is concerned, in the Table, 1 being taken away, leaves the Table for Case II.

CASE III.							Mr. Robinson's Answer.		
Sixes.	Fives.	Fours.	Threes.	Twos.	Ones.	Game	1 st Case.	2 ^d Case.	3 ^d Case.
1	2	3	0	1	1	31	5 Fives - 25	3 Sixes - 18	1 Six - 6
1	2	3	0	0	2	31	1 Six - 6	2 Fives - 10	3 Fours - 12
1	2	0	4	2	1	31	3 ¹	1 Three - 3	2 Fives - 10
1	2	0	4	0	3	31		3 ¹	1 Three - 3
1	0	3	4	0	1	31	3 Fives - 15	2 Sixes - 12	3 Fours - 12
0	2	3	0	4	1	31	2 Sixes - 12	3 Fives - 15	3 Threes - 9
0	2	3	0	3	2	31	1 Four - 4	1 Four - 4	2 Fives - 10
							3 ¹	3 ¹	3 ¹

X. QUESTION 616, answered by Mr. William Sherwin.

FIRST, $\frac{71}{50 + 40} = 78$ Days before A and B first meet; at which Time

C will be going towards them, and his Distance from them, at the End of that Time, = 21.480188 Miles. And, as A goes 50, and B 40, Miles each Day, A will go five Times round, while B goes four Times round the Island. Whence, $71 \times 5 = 355$ Miles, travelled by A; and $71 \times 4 = 284$ Miles, travelled by B, before they meet at the Place they set out from; at which Time C will have travelled 288 Miles.

Mr. Mouldale answers it thus.

LET D be the Place of their first setting

out; then $4 + 5 : 71 :: 5 : 39 \frac{4}{9} =$ Dist. from

D, when A and B first meet at F; and FI =

$3 \frac{17}{18}$. Again, $40 + 50 = 90 : 71 :: 1 : \frac{71}{90} = DE$,

the Dist. C has gone, when A and B meet at

F. And $EF = \sqrt{EI^2 - FI^2} = 21.47$ M, the Distance of C from A and B, when they first meet.

Secondly. Let $x = M$, travelled by A, before they meet together at D; then

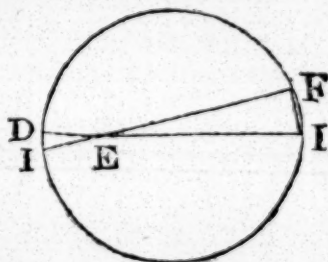
$\frac{4x}{5} =$ Miles travelled by B. Consequently, $\frac{4x}{5 \times 71} =$ whole Number, and

the least Value of $x = 355$; so that $\frac{4x}{5} = 284$, the Miles travelled by B.

And $\frac{355}{50} = \frac{284}{4} = \frac{7}{10}$ Days, the whole Time before A and B meet at D;

in which Time C has travelled a Space = 28.775 Miles, and is returning, from I, towards A and B, at D. W.W.R.

Mr.



Mr. James, assuming 12 Hours for a Day, (though 24 are generally understood,) alledging that the Number of Hours travelled *per* Day, by A and B, should have been given: Then, (according to 12 Hours in a Day,) by *Quest.*

A travelled $4\frac{1}{6}$, and B $3\frac{2}{6}$ Miles *per* Hour; being in the Ratio of 5 to 4 (ac-

cording to Mr. Sherwin). Hence, as $\frac{5}{4} : 71 :: \left\{ \begin{matrix} 5 \\ 4 \end{matrix} \right\} : \left\{ \begin{matrix} 39\frac{4}{9} \\ 31\frac{5}{9} \end{matrix} \right\}$ travelled by A and B, when they first meet in the Circumference of the Island; at which Time, C will not have advanced more than $\frac{1}{4}$ Mile across the Island's Diameter; being then going from A and B, and is distant 8 Miles, *nearly*. Moreover, since the Ratio of travelling is as 5 to 4, it is evident that when B will have travelled four Times round the Island, A will have gone five Times round the same; at which Instant they will be together, at the Place they set out from.

Hence, $71 \text{ M.} \times 5 = 355$ Miles, travelled by A, and $71 \times 4 = 284$ Miles, travelled by B. Therefore, as $\left\{ \begin{matrix} 4\frac{1}{6} \\ 3\frac{2}{6} \end{matrix} \right\} \text{ Hour} : 1 :: \left\{ \begin{matrix} 355 \\ 284 \end{matrix} \right\} : 85\frac{2}{10} = 7\frac{1}{10}$ Day, $\left\{ \begin{matrix} A \\ B \end{matrix} \right\}$ travelled.

Mr. Robinson finds $39\frac{4}{9}$ Miles travelled by A, and $31\frac{5}{9}$ travelled by B, according to his Process. That A and B had nine Meetings before they came to the Place whence they set out, when A had travelled 284 Miles, (four Times round the Island,) and B 355 Miles, (or five Times round,) in the Space of $7\frac{1}{10}$ Days, in which Time C had travelled across the Island, and 5.21 Miles back again, towards A and B, which he performs without considering the Hours in a Day. W.W.R.

Mr. Wilkinon finds 39.44 M. D-ft. travelled by A, before meeting with B, who has travelled 31.55 Miles, and .7837 Mile, advanced by C, when A and B met; and 21.4678 Dist. of C, from A and B, at their Meeting, It is also evident, that C will be going towards A and B, at that Time.

Mr. Barrow solved it; as did Mr. John Gedney, of Wyton; and Mr. John Gruby, of Coventry.

XI. QUESTION 617, answered by Mr. Moulsdale.

PUT $AC = a$, $CD = b$, $EC = EF = x$, the Side of the Square. By the Property of the

Curve, we have $a^2 : b^2 :: \overline{a+x} \times \overline{a-x} : x^2$;

th. $a^2 x^2 = a^2 b^2 - b^2 x^2$; whence $a \times \sqrt{a^2 + b^2}$

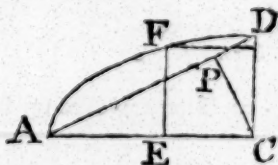
$= a + b$; th. $\sqrt{a^2 + b^2} = (AD) : a (AC) :: b (DC) \times (PC) = EC$.

Q.E.D.

Mr. Robinson has given a Demonstration as follows.

PUT $b = AC$, $c = CD$, $x = CE = EF =$ Side \square . Th $b + x = 2 AC + CE$; and $b - x = AE$. By Conics, $b^2 : c^2 :: b^2 - x^2 : c^2 b^2 - c^2 x^2$. Reduced, $c^2 b^2 = \overline{b^2 + c^2} \times x^2$. Therefore, $x =$

bc



$\frac{bc}{\sqrt{b^2 + c^2}}$. Side of the Square, required. Hence, the Demonstration of this Proposition is seen to depend intirely on the Property of the right-angled Triangle, ACD : For, $\sqrt{b^2 + c^2} = AD$; then, by similar Triangles, $AD : CD :: AC : CP$; that is, as $\sqrt{b^2 + c^2} : c :: b : \frac{bc}{\sqrt{b^2 + c^2}}$, as before.

Mr. Cartill gives a particular Case, proving the Truth of the Proposition; and then gives a general Demonstration of the same Proposition, by the Property of the Ellipsis, and of similar Triangles. Mr. Sberwin also gave a Demonstration of the same Truth; as did Mr. Fletcher, intirely geometrical. Mr. Rowe gave an analytical Demonstration; as did Mr. Barrow, of Welton School; and Mr. Sanders, of Cöttingham.

XII. QUESTION 618, answered by the Proposer, Mr. Robinson.

PUT $a = 24$ Inches, inside Diameter of a Copper Globe, $x =$ the Diameter of the Cork Globe. $24 + 1.5 = 25.5 = m$, the outside Diameter of the Copper-Globe; $c = 5.2083$ Oz. Weight of a cubic Inch of Copper, $d = .5787$ of common Water, $n = .13773$ of Cork, $p = .5236 p \times 3m^3 - ca^3 =$ Weight of the Copper; $p \times dm^3 =$ Weight of Water to be removed; $p \times na^3 =$ Weight of the Cork; $p \times \frac{2dx^3}{3}$, Weight of the Water displaced

by the Cork-Globe. Whence, $c \times m^3 - a^3, - d \times m^3 = nx^3 + \frac{2dx^3}{3}$.

$$\text{Reduced, } x = \sqrt[3]{\frac{c \times m^3 - a^3, - d \times m^3}{n + \frac{2d}{3}}} = 21.35 \text{ Inches, the Diameter of the Cork-Globe. W.W.R.}$$

Mr. Joseph James (who is one of our Champion Investigators) deduces the following Answer.

By a Table of specific Gravities, P. 83, *Practical Arithmetician*, a cubic Inch of Copper, common Water, and Cork, weighs 5.2084 Oz. .5787 Oz. and .1342 Oz. Avoirdupoise, respectively.

Now, put $a = 24$ Inches, $\frac{1}{2}b = \frac{1}{2}$, $c = 5.2028$, $d = .5787$, $f = .1342$, $p = .5236$, and $x =$ Diameter of the Cork-Globe. Then, by Mensuration,

$$a + b \big|^3 - a^3 \times pc = 17519.68765702 = \text{Weight of the Globe of Cop-}$$

per, and $a + b \big|^3 \times pd = 5024.278000665$ Avoird. = Weight of the Water dislodged by it. Hence, putting $m = 17519.68765702$, and $n = 5024.278000665$,

$$\text{we have } \frac{2}{3}dpx^3 + pfx^3 = m - n. \text{ Consequently, } x = \sqrt[3]{\frac{m - n}{\frac{2}{3}dp + pf}} \text{ equal to}$$

20.950096 Inches = Diameter of the Cork-Globe, required.

N. B. The above Solution confirms the Truth of the Proposer's Solution, by a very near Coincidence of the Answers, from the same Principles. Mr. Gedney, of Weyton, by an elaborate Process, makes the Diameter = 44.2 Inches; near Mr. Sberwin's Number, from other Principles.

Mr. Cartill finds the Answer to be = 26.7833 Inches, the Cork-Globe's Diameter, who is elaborate in his Process, but must have fallen into some Mistake somewhere; Mr. Fletcher gives no Numbers to compare with others; and, therefore, his Process is of no Use, or not to be depended on, being Time thrown away, as has often been urged to Correspondents, like Mr. Sanders, of Cottingham, (who seem to have seen each Other's Solutions,) making the Diam. = 26.52589 Inches.

Mr. Sherwin, concisely answers the same by this Expression, viz. $x =$

$$\frac{d - bs}{b} \times \frac{1}{3} = 44.55 \text{ In. the Diam. of the Cork-Globe, which we}$$

with him to revise. He puts $s = 25.51^3 \times .5236$; $d = 6853.710773 \text{ Oz. Troy}$, Weight of the Copper-Globe: $b = \text{Oz. Troy, } .527458$, Weight of a cubic Inch of Water.

Mr. Alex. Rowe finds 44.205 Inches, the Cork-Globe's Diameter. Mr. Mouldale makes the Diameter = 28.66 In. by an elaborate Process. He concludes thus:

If the Proposer means to sink the Diameter $\frac{2}{3}$ in the Water, put $3x = \text{Diam.}$ then $7x^3 \times .5236 + 8226 = 27x^3 \times .5236$, and $x = 9.227$, so that the Diam. of the Cork-Globe, this Way considered, is 27.681 Inches.

These Disagreements we cannot take upon us to examine through the whole Processes, (as a Task too laborious, and taking up too much Time and Attention,) but leave their Revise to the Authors, who should be all Attention when they perform Operations for the Public, designed to establish Truth in Science. They should prove every Step, as they proceed in their Operations, by casting away Nines, being a confirming Probability if they prove so cast away.

We think the late ingenious Mr. Cocbran was never erroneous in his Operations, nor yet in his Principles and Conclusions; who was so *unerring*, that his Productions were a Standard to measure the Productions of other Correspondents. In pure Geometry (in which no Construction was too hard for him) he was not excelled! And, in all Parts of Mathematics, he undertook to reason upon, he was as concisely clear as full in all his Performances, and was as elegant as correctly conclusive; never suffering a Blunder to go out of his Hands.

XIII. QUESTION 619, answered by Mr. W. Sherwin.

PUT the Sine of the $\angle ECD = x$, $AC = 39 = a$, $EC = 45 = b$, $s = \text{Sine, \&c.}$
 $= \text{Cof. given } \angle ACE$. Then, (Rad.) $1 : a$

$:: x : ax = ED$, and $\sqrt{a^2 - a^2x^2}$, or a

$\sqrt{1 - x^2} = CD$, whence $ax + a\sqrt{1 - x^2} - a = \text{Diam. of the Circle FGH}$.

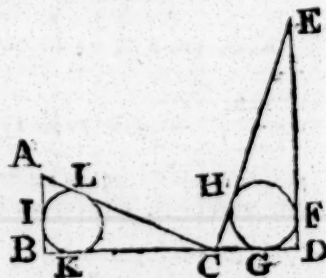
Again, the Sine of $\angle ACB = cx + s$

$\sqrt{1 - x^2}$, and its Cof. $= sx - c\sqrt{1 - x^2}$,

then (Rad.) $1 : b :: cx + s\sqrt{1 - x^2} : bcx + bs\sqrt{1 - x^2} = EC$: Also

(Rad.) $1 : b :: sx - c\sqrt{1 - x^2} : bsx - bc\sqrt{1 - x^2} = AB$; whence the

Diameter of the Circle IKL $= \overline{bc + bs} \times x, + \overline{bs - bc} + \sqrt{1 - x^2}$, $= ax$



$= ax + a \sqrt{1 - x^2}$, $-a$, by *Quest.* In Numbers $x^2 = .28435855$ $x = .56515871$; solved $x = .9072977 = \text{Sine } 65^\circ 8' = \angle ECD$, and $260 52' = \angle ACB$.

But where is the Diameter of the Circle, to compare with the Conclusions of Others, and prove the Truth of the Process and Conclusions? *Pall. Auth.*

Mr. Fletcher goes through an elaborate Process, determining several unknown Quantities, but finds no Diameter to the same inscribed Circle, and no Conclusions to compare by.

Mr. Robinson finds $\angle DCE = 78^\circ 32'$, $\angle BCA = 13^\circ 24'$, (Mr. Gedney $78^\circ 52'$ and $13^\circ 8'$.) $CB = 37.94$; $BA = 9.038$, $ED = 44.1$, $CD = 8.967$.

Mr. Cartill's, the Proposer's, Solution.

PUT $a = 45$, $b = 39$, $s = \text{Nat. Sine } 88^\circ = .9993908$, and $c = \text{its Cos. Rad.} = 1$, $x = \text{S. } \angle ECD$, its $\text{Cos.} = y$; then Sine and Cos. Sum of the Angles ACE and $ECD = \text{Sine and Cos. } \angle BCA = sy + cx$ and $sx - cy$.

By Trig. As $1 : a :: \left\{ \begin{array}{l} sy + cx : \frac{sy + cx}{sx - cy} \times a = AB \\ sx - cy : sx - cy \times a = CB \end{array} \right\}$ Also, $1 : b :: \left\{ \begin{array}{l} x : bx = DE. \\ y : by = CD. \end{array} \right.$

Then, $sy + cx \times a + sx - cy \times a - a = bx + by - b$, by *Question*.

Which Equation, divided by a , gives $sy + cx + sx - cy - 1 = x + y - 1$

$\times \frac{b}{a}$; put $q = \frac{b}{a}$. Th. $sy + cx + sx - cy - qx - qy = 1 - q$. Let

$s - c - q = w$, and $c + s - q = m$, $1 - q = n$; then, by Substitution,

$dy + mx = n$. But, by 47 E. 1, $x = \sqrt{1 - y^2}$. Th. $dy + \sqrt{m^2 - m^2 y^2} =$

n . By Involution and Transposition, we get $y^2 - \frac{2dn}{d^2 + m^2} \times y = \frac{m^2 - n^2}{d^2 + m^2}$.

In Numbers, $y^2 = .69255149$ $y = .2739746949$; solved $y = .97387558 = 76^\circ 52' 28''$, and $x = .22708224 = 13^\circ 7' 31''$, 26: Also $CD = 37.9811783$, and $ED = 8.8561974$, $AB = 44.1543639$, and $BC = 8.68301178$, and the Diameter of the same inscribed Circle = 7.83757 ; like Mr. Sanders's Numb. (agreeing with Mr. Rowe's Diam. and other Numb. nearly). W.W.R.

Remark. Mr. James makes $\angle BCA = 24^\circ 39'$, and $\angle ECD = 64^\circ 31'$; we wish it true, and all his other Numbers. If a careful Analyst compares the vast Difference in the foregoing Solutions, he will be induced to believe that there is no Truth to be depended upon in mathematical Calculations, and that only the Name of Truth subsists among Mathematicians. Had a fair Deduction of the Diameter of the inscribed Circle, by these different Computers, been made, there had been at once an End of the Doubt (provided two Solutions had agreed) of who is right; and there had been no Doubt of the Error of those differing from such Agreement in two Solutions. So they may all go to Work again to find out Infallibility. *Pal. Auth.*

XIV. QUESTION 620, answered by Mr. Marsden, of Netherhurst.

PUT $c = 3.1416$, $P = \text{Tension}$, $d = 39.126$, $l = 40$, $p = 32$, and $N = \text{Number of Semivibrations of the Wire}$. Then, by *Coroll. 1st Prop. 24.*

Smith's Harmonics, $N = \sqrt{\frac{c^2 P d}{p l}} = 129.37$; Semivibrations = 64.685 ,

the Vibration of C, the lowest String, or of the Wire String. Then, as 2 : 3 (Ratio of a 5th,) :: $\begin{cases} 64.685 : 97.027, \text{ Vibrations of G, the 3d String.} \\ 97.027 : 145.54, \text{ Vibrations of D, the 2d String.} \\ 145.62 : 218.25, \text{ Vibrations of A, the 1st String.} \end{cases}$

XV. QUESTION 621, answered by Mr. W. Sherwin.

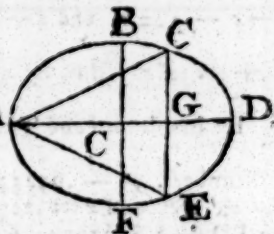
FIRST, $\frac{x}{2} \times x^{\frac{x-1}{x}} = \frac{2x-1}{2} = \text{Area of the right-angled Triangle.}$
 And (47 E. 1.) $\sqrt{\frac{2x}{x} + \frac{2x-2}{x}} = \text{Hypothenufe} = \text{circumscribing Circle's Diameter, whose Area} = x + x^{\frac{2x-2}{2x-1}} \times .7854 = \frac{1}{2}x + 469496.9728 \text{ by Quest.}$ Whence $x = 4$, the Base = 256, and Perpendicular = 64, Hypothenufe = 263.87. W.W.R.

Mr. Robinson answered it in like Manner; as did Mr. Fletcher; Mr. Mouldale; Mr. Joseph James; Mr. Cartill. Mr. Reed answered it by Trial; Mr. Rowe solved it analytically; as did Mr. Barrow, of Melton School; Mr. Gedney, of Wyton. Mr. Sanders, of Cottingham, answered it too late.

XVI. QUESTION 622, answered by Mr. W. Sherwin.

LET ABDE be the given Spheroid, ACE the required Cone; put $t = \text{Transverse} = AD$, $c = \text{Conjugate BF}$, and $x = AG$; then, by the

Property of the Ellipsis, $\frac{1}{2}t : \frac{1}{2}c :: \sqrt{tx - x^2} : \frac{c}{t} A$



$\sqrt{tx - x^2}$, a Maximum, by Quest. In Fluxions,

and reduced $x = \frac{2}{3}t = 40$; whence 14893.47 cubic Inches, the solid Content of the Cone. W.W.R.

Mr. Robinson finds, by the Method of Fluxions, the Content = 14802.3734, Cone's Axis 41.462; Mr. Mouldale, by an elegant Process and Fluxions, finds the Diameter = 36.928, the Cone's slant Side 46.398, Superficies 2641.391, Solidity 14678. Mr. John Fletcher accurately determines the Diameter at Base = 36.230732, and Height = 42.7132176, Solidity = 14678.63872, by a similar Process to that of Mr. Sherwin's, confirming the Truth of each other. Mr. Alex. Rowe's Solution confirms the same.

Mr. Cartill, by a Process and Fluxions, determines the Cone's Altitude = 42.713217; but gives no Content. He is right, as we find by Mr. Thomas Barrow's Solution, that coincides, who makes the Solidity = 14678, the same with Mr. Mouldale.

Mr. Sanders, of Cottingham, by the Properties of the Ellipsis, finds the Curve Superficies = 2640.4455488, but gives no Content of the Cone, required.

XVII. QUESTION 623, answered by Mr. Mouldsdaie.

PUT $AB=10=a$, $DB=x$, $AD=a-x$; then, by
sim. Triangles, $a : 5a :: a-x : 5a-5x = DE$;

and $FE = DE - DF = 5a - 5x - \sqrt{2ax - x^2}$,

which, \times d by $PI = x$, is $5ax - 5x^2 - \sqrt{2ax^3 - x^4}$,
= a *Maximum*. In Fluxions, $5a\dot{x} - 10x\dot{x} -$

$\frac{3ax^2\dot{x} - 2x^3\dot{x}}{\sqrt{2ax^3 - x^4}} = 0$; reduced, $\sqrt{2ax - x^2} =$

$\frac{3ax - 2x^2}{5a - 10x}$; whence we get $x^3 - 30x^2 + 225x =$

480.769; solved, $x = 3.9069 = PI$; $PE = 22.53$,
and the Area of the greatest inscribed Parallelogram =
88.005, &c. W.W.R.



Mr. *Sherwin*, the Proposer, accurately determines the End of the *Parallelogram* by the given Properties and Method of Fluxions, viz. $PI = 3.9068547728$, and $PE = 22.5364398332$; whence, the greatest Area = as above, and to a greater Number of decimal Places. This Correspondent observes, that the Area of the greatest inscribed *rectangular Parallelogram*, in this Case, is = the greatest inscribed *oblique* one.

Mr. *Sherwin* makes the Length of the Parallelogram = 22, Breadth 4, and Area 88, nearly.

Mr. *Cartill* gives 20.93179 the Length, and 4.186 the Breadth, making the Area less than 88, through a Mistake in his Process.

Mr. *Robinson* makes the Length 22.5675, and Breadth 3.9014, near the Truth, or, perhaps, the nearest. Mr. *Sanders* makes the Length = 20.931783, and Breadth = 4.1863566, who is, apparently, out of his Latitude, again, in July.

XVIII. QUESTION 614, answered by the Proposer, Mr. Sherwin.

HE corrects the Equations to what they should have been printed:

$$\text{viz. } \begin{cases} yx^4 + y^2x^6 - y^4x^2 = 4032.25 \\ x^2y^6 + y^2 = 11640x^4 \end{cases} \text{ He puts } a = 4032.25, b = 16640,$$

$$y^2x = p, \text{ and } \frac{x^2}{y} = q, \text{ when the}$$

given Equations become $p^4 + p^2q^2 - p^2 = a$, and $p^2 + 1 = bq^2$. By the

last of which, $q^2 = \frac{p^2 + 1}{b}$; put this Value for q^2 in the other Equation,

then $p^4 + \frac{p^4 + p^2}{b} - p^2 = a$, or $p^4 - \frac{b-1}{b+1}p^2 = \frac{ab}{b+1}$ being a Quadratic.

Solved, $p^2 = \sqrt{\frac{ab}{b+1} + \frac{b-1}{2b+1}}^2 + \frac{b-1}{2b+1} = 64$, and $p = 8$, $q =$
0.625, $x = 0.5$, and $y = 4$. W.W.R.

Mr. *Robinson*, correcting the Numbers, gave a true Solution by Quadratics.

XIX. QUESTION 625, answered by Mr. Mouldale.

THE Money each Person paid for his Share is easily found to be as follows: *Viz.* A, 21d. B, 34d. and C, 46d. whose Sum = 102d. or 8s. 6d. And

$15^2 \times .7854 = 176.725$ the Area of the Cheese.

Whence $\begin{cases} 22:38.116, \text{A's Share of the Area.} \\ 34:58.908, \text{B's Share.} \\ 46:79.697, \text{C's Share.} \end{cases}$

Let C have the middle Zone, EF.

Put DE = x , versed Sine of A's Share, then, by

this Theorem, $\frac{4}{3} \times \sqrt{15x - .608x^2} = \begin{cases} 38.116. \\ 58.908. \end{cases}$

Hence $x = 4.08$, for A's Share.

And GF = 5.515, for B's Share.

FE = 5.405, for C's in the Middle.

But, if C has the Segment FG, then FG = 6.923, and EF = 3.997 for B. Now, by immersing a Pound of Cheese, (of sound Gloucester,) in a cylindric Vessel, full of Water, I found a Pound measure 25.66 Inches; hence, $176.725 \times 3 = 530.175$ Inches, the Solidity of the Cheese; and, dividing by 25.655, gives 20.688 Pounds Weight; and, therefore, it cost nearly 5d. per Pound. W.W.R.

Mr. Robinson gives Part of the Answer, but does not go through with it. Mr. Sherwin finds the Properties of the Surface, nearly, as above; and pursues the Answer no farther, from supposing the latter Part of the Quest. unlimited, through the Weight of 1 cubic Inch of Cheese being not given: which is given among specific Gravities. Mr. Penn divided the Cheese into Shares, from Rules, in Mr. Hutton's Mensuration, P. 131.

Mr. Cartill's Solution is as follows:

	s.	d.	Ynches.	Inches.	} The Area of the sim. Segments is as the Squares of their Diameters, i. e. As 15^2 : 38.115 :: 12^2 : 1694 Area of a sim. Seg-
A paid	1	10,	his Area 38.115,	Solidity 114 345	
B paid	2	10,	his Area 58 905,	Solidity 176.715	
C paid	3	10,	his Area 79.695,	Solidity 239.085	
Sum	8	6.	Sum 176.715	Sum 530.145.	

ment, whose Diameter = 1. And as $15^2 : 79.695 :: 12 : 0.3542$ *Dino.*

By a Table of circular Segments, the versed Sines to the above Areas are .268094, and 0.461462. But the above versed Sines are as their Diameters.

Th. as 1: $\begin{cases} .268094 \\ .461462 \end{cases} :: 15: \begin{cases} 4.02141 = \text{versed Sine to A's Share.} \\ 6.92193 = \text{versed Sine to C's Share.} \end{cases}$

Hence the Chord to A's Share = 13.289, and C's Share = 14.98537.

The specific Gravity of Cheese = 1.1821; th. the Weight of 1 Inch = 22.75556 lbs. *Avoirdupoise*; whence the Weight of the whole Cheese = 22.666646 : 8s. 5d. :: 1 lb. : .375s. = $4\frac{1}{2}$ d. per lb. W.W.R.

Mr. W. Burke finds the Chord Lines true, but is lost in specific Gravity of Cheese, for Want of making Experiment. Mr. Gedney finds the Weight of the Cheese = 19.3538 lb. and 5 $\frac{1}{2}$ d. nearly the Price of 1 lb. who says, by Experiment, that 1 lb. of firm Cheese = 27.34 cubic Inches, but differs according to its Porousness. Mr. Sanderfon is right in his versed Sines, but determines no specific Gravity, or Price of the Cheese,

XX. QUESTION 626, answered by INVESTIGATOR.

THE several Heights of a Tree, (whose solid Content you would measure,) requiring as many *Girths* to the Middle of each Height, may be taken from one Station, at a given Distance, on a horizontal Line from the Tree, with the Angle at the Base, to each Height, and its middle Height, as the Tree stands; from whence (first entering the same in a Field-Book) each Height, and middle Height, may be accurately determined, with little Trouble, by *Tables* on Purpose.

Then, find the *Girth*, at each *middle Height* taken, by a small Cord, one End thereof fixed to the End of a very long tapered Pole, or Rod, and the other running through the End of another similar Pole, or Rod, of equal Length, like a Needle's Eye, with the Cord hanging down a certain Length below the other End of the Pole, so that bringing the two Poles Ends round about the Tree together above, at each *Girth-Place*, pulling the Cord back, tort, the Quantity of Cord shortened may be measured; which, shortening in carrying the Cord round the Tree above, will be the *Girth* in each Place: Whence each Tree's solid Content may be easily and very nearly determined.

Two *Girths* and two Heights, taken, in most Trees standing, will be sufficient for estimating their solid Feet. But, in very tall and large Trees, a proper Person must ascend them, by Means of a long Ladder, to such a Situation, whereby he can take two *Girths* above, and as many below, to the middle of four respective Heights observed.

Or the Heights may be taken severally by one of the long tapered Poles, properly marked into Divisions of *Feet and Inches*; or otherwise the shortening of a measured Cord, carried through the Needle's Eye, of that Pole's End, to the Height required to be taken, the other End of the Cord being nailed below, for shortening, by a given Quantity of Cord, having one End fixed below, and another running through the Needle's Eye of that Pole's End, carried to the Height required to be known, will be the shortening of the Cord measured. But enough of this Cord must be allowed for running out of the Needle's Eye, and shortening, to serve the Purpose required.

N. B. The Needle's Eye, at the upper End of one of the equal Poles, must be threaded below, with the given Length of Cord, to reach from the other Pole's End, where that Cord's End is fixed, round the back Part of the Tree, before the Ends of both Poles are elevated together, to measure the *Girth* round any Part above, or by bringing the upper Poles Ends together, where the *Girth* is to be taken; straining the loose Cord hanging down, to find the true shortening, by the Cord carried round the back Part of the Tree.

If Branches of the Tree intercept the Elevation of the two Ends of the Poles together, the Pole with the Needle's Eyes, threaded with the long Cord, must be separately carried to the Place where the *Girth* is to be taken at the contrary End of that held by the Hand, with a Plummets or Piece of Lead, to bring down the other Cord's End to be fixed below, at the End of the other Pole: Afterwards to be elevated to the same Place with the other Pole's End, for finding the *Girth* round the back Part of the Tree as before. In this Case there must be double Length of Cord allowed, for bringing the Plummets down at one End, while the Hand holds the other End, running through the Needle's Eye.

Q. E. D.

The above Method by Investigator, for Practice, appears to excel every other Method we have seen, it being an *actual*, not artificial, Measuring.

All other Methods, communicated, appear to us impracticable or absurd.

✍ We are informed, by a capable Correspondent, that the Proposer's Method of measuring Timber, as it grows, is not practicable, any more than finding an inaccessible Distance at one Station, as some have pretended to do.

Remarks

Remarks on W. Veck's Pretensions and Performances, in last Year's Palladium.

AS we were induced, by a *fallacious Recommendation*, to speak as we did of *W. Veck*, in last Year's *Palladium*, we think it a Piece of Justice to undeceive our Correspondents in this extraordinary pretended *Measurer of Timber as it grows*, and *Land-Surveyor*. The Principle by which he pretends to determine the Content of the Timber, as it grows, is by a *small Instrument of hard Wood*, which we have seen, fit for a Child's Plaything, in small Divisions, with which he amuses and deceives you, in finding a Tree's Height and Diameter, between different Joints, in Order to find the whole Content; though the Diameter of any Tree, as it grows, is different, at the same Circumference, or Girth, by which he determines that Circumference, or Girth. For there is a greater or less Swell of the Wood from the Tree's Center, (it swelling the most to the Southward,) where the Diameter is taken by another Deception of *angular Lines*, touching both Extremes of the Circumference. Whereas the Distance, or Height, of an *inaccessible Object*, might as correctly be taken by the Divisions of a *small Instrument*, of Wood, (framed together,) as his is, about a Foot in Length, at one Observation, as to find a Tree's Height, and Diameter, at different Places, between the Joints, by his *insufficient Instrument*.

This being a gross Imposition on *Truth and real Science*, we therefore being induced, by *Deception*, and false Commendation, to insert, at P. 58, *Pall.* 1778, what we did, we explode the *detestable Falsehood*, and misguided Assertion, as much as we do the *quack Pretension*!

We are farther informed, by good Authority, that the Answers to Questions, and Questions proposed, in last Year's *Palladium*, in *W. Veck's* Name, are not his; no not one; and therefore we discover it as Imposition. And as we have discovered his *Inability* since, to determine of *himself*, some Requisites necessary to be known in the Art of *Surveying*, we will abide by the Truth of the foregoing Assertion. Who, we are informed, should go to School for Improvement in the Knowledge of common *Arithmetic*, *Geometry*, and *Analytics*, necessary in the Art of *Surveying*, rather than pretend to so much Instruction of Others, in Things wherein he is deficient.

What he proposes to perform by the *Chain only*, is but dividing *Fields*, or *Inclosures*, into a proper Number of Triangles, or other Figures depending thereon, (which a *Novice in Mensuration or Surveying* can perform,) when the respective Dimensions of these right-lined or *curve-lined* Figures (allowing for the Depths of the Bends) be connected together, or laid down by *Scale and Compasses*, in a Plan, or *Plot*, upon Paper, they will exhibit a Map, or Plan of the *Survey of the Estate*, he so much boasts of as *new*, though but a common *Performance*.

We do not say this to depreciate or detract from *real Merit*, (to which we always give due Honour,) but to strip off the *Lion's Skin*, or *borrowed Plumes*, this Assumer vainly put on, in last Year's *Palladium*, without a Right to wear them.

If be object to the foregoing Assertions, we are ready to give him Proof of his *Disabilities in Science*, or *Inability to perform what he has pretended in last Year's Palladium*, as we cannot suffer the Imposition to pass unnoticed.

N.B. We are sorry to find that his Pretensions far exceed his *Abilities to perform*, in which he, by imposing on our Credulity, made us his Instruments of Delusion, in this and other Respects. But we have done with him, except what our Correspondents and Truth have to say.

PALL. AUTH.

XXI. QUESTION 627, answered by Mr. Jonathan France, of Hope School.

THIS Correspondent curiously delineates a Cannon, with its proposed Dimensions, giving the *Density* of its Ball, and Quantity of a Charge, to determine from thence the Velocity which the Ball will acquire from the *Explosion*, supposing the Elasticity of Powder, at the first Instant of its first Firing, to be given.

In the Solution of this difficult Problem, he assumes the two following Principles. 1. That the Action of the Powder, on the Ball, ceases as soon as it gets out of the Piece. 2. That all the Powder of the Charge is fired, and converted into an elastic Fluid, before the Ball is sensibly moved from its Place. Then he proceeds, analytically, to represent the Axis of any Piece of Artillery, the Breech, the Muzzle, and the Diameter of its Bore, and the Part of its Cavity filled with Powder; then, to the Pressure exerted on the Surface, at the Explosion, or that exerted in the Direction of the Cylinder. In which, reasoning from *Parallels*, *Asymptotes*, and the *Hyperbola*, and its *Ordinate*, Force of impelling Fluid, its *Density*, Force of the Points of the Cylinder, in a physical Way, till the Subject is involved in an *analytical Labyrinth*, as difficult to unravel as to determine the absolute Quantity of Motion of animal Spirits, exerted by the Will on the Nerves, in muscular Action. But after an infinite Series of Thought, and *analytical Deduction*, he at last comes to this *analytical Conclusion*, viz.

$$\sqrt{\frac{mry}{xy^2 - p}} \times \frac{1}{t} \times \text{Log.} \frac{rxy}{p} \times \sqrt{\frac{xy^2 - p}{y^8}}, \text{ which}$$

(by *Quest.*) must be a *Maximum*. Put into Fluxions, 1st, with x constant, and then with y constant, and each Expression made $= 0$, there will arise two Equations, whereby the Value of x and y is found to be (if no Mistake be made) as 92.6 to 1, or the Diameter of the Bore to the Length of the Piece will be as 1 to 92.6, nearly! Is it probable? Answer, ye judicious.

Mr. Alex. Rowe supposes certain Dimensions to be a *Maximum*, giving the greatest Force, and thence determines the Ratio of the Diameter to the Length of the Bore, (according to the *Supposition*,) as .6844 lb. to 1 lb. which he concludes can be of no Use in the present Construction of Guns; since a Piece of Ordnance, of 9 Feet long, would have 2.0532 Feet Diameter of Bore, in lowest Terms; being as 4.4 to 1, nearly.

XXII. QUESTION 628, answered by Mr. Robinson, of Biddick.

PUT $c = 4.5 = AB$, $b = 3 = AE$, $a = 25 = BC$, $d = 3.5 = EC$, the square Piece of Wood; $x =$

HB , $y = AF$, 47. E. 1. $\sqrt{a^2 - x^2} =$

CH ; $\sqrt{b^2 - y^2} \frac{1}{2} = EF$; th. $\sqrt{b^2 - y^2}$

$= \sqrt{a^2 - x^2} = CK$. G, the Cen-

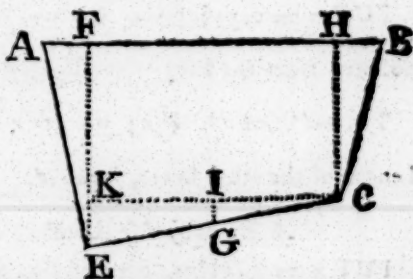
ter of Gravity, $EG = GC$. Then,

as $EC : EK :: CG : IG$; which,

by the Property of the Center of Gravity, is a *Maximum*; that is, as $d \times$

$$\sqrt{b^2 - y^2} - \sqrt{a^2 - x^2} :: \frac{d}{2} : \frac{1}{2} \times \sqrt{b^2 - y^2} - \sqrt{a^2 - x^2} = IG.$$

$$\text{In Fluxions, } \frac{-yy}{\sqrt{b^2 - y^2}} + \frac{xx}{\sqrt{a^2 - x^2}} = 0; \text{ reduced, } b^2x^2 - y^2x^2 - y^2x^2.$$



Th.

Th. $y = \frac{bx}{a}$, and $\frac{bx}{a} + x = \frac{b+a}{a} \times x = mx$, and $c - mx = CK$, $\frac{b}{a} -$

$x = n$, and $n \sqrt{a^2 - x^2} = KE$ (47. E. 1.) $\overline{CK^2} + \overline{EK^2} = \overline{CE^2}$ i.e.
 $c^2 - 2mcx + m^2x^2 + n^2x^2 - n^2x^2 = d^2$; solved, $x = .4925$, y
 $= .591$, $CK = 3.417$, $EK = 0.491$, th. $\frac{EK}{CK} = .14395 = \text{Tang. } 8^\circ$

$11'$, the Angle required.

Otherwise. By the Resolution of Forces, $BH \times EF \times EG = AF \times CH \times CG$, will produce the same Equation as before; viz. $b^2x^2 - y^2x^2 = a^2y^2 - y^2x^2$.

As to the latter Part of the Question, if the Cone's Base is fixed at C, the Axis and Semidiameter will make an Angle of $7^\circ 19'$ below the horizontal Line.

N. B. Mr. Dutton never once looked towards this Question, though we gave him an Opportunity of exercising his *mechanical* Talents. Who has proposed new Difficulties for Others to unravel.

Mr. Cartill's Solution.

THE Center of Gravity of the Paralleloepidon Piece of Wood, suspended, will be in the Middle thereof, and will settle to the lowest Place possible; and, when in that Position, the *Trapezium* formed by it, and the suspending Cords, will be a *Maximum*; consequently may be inscribed in a Circle, whence its Area = 10.795506 Yards; the Diameter of its circumscribing Circle = 4.912849 Yards, and the required Angle = $6^\circ 38' 16''$. W.W.R.

N. B. It is not mentioned whether the Cone's Base be suspended by the longer or shorter Line; let it be which it will, it is universally solved as in *Emerson's Mechanics*.

Remark. Without mentioning, it is implied in the Question, that the Cone is suspended like the *Paralleloepidon* Piece of Wood, with the Cone's Base the lowest; it would not settle the lowest so well, with the bigger End suspended by the shortest Cord, being another Problem to solve, much more difficult than the first. *Pal. Auth.*

XXIII. QUESTION 629, answered by Mr. Robinson.

PUT $m = 0.53637$ Oz. Avoird. Weight of a cubic Inch of Oak, 56 lb. \times 16 = 896 Oz. = n , $c = 8$, $d = 6$, $x =$ Length in Inches. Th $d^2x =$ Solidity from the Prop to the End, $d^2c =$ that from the Prop to the Weight.

Th. $md^2x = d^2c + n$; whence $x = c + \frac{n}{md^2} = 55.402$ Inches, the Length of the other Lever, required.

Answered by Mr. Lobster, of Tankerly-Common Side.

PUT $x = 6$ Inches, $b = 56$ lbs. and $x =$ Length of the longer End, $c = 8$ Inches, $d = 0.0330946$, then $a^2xd + b = 65.5312448$ lbs. and $a^2xd =$ the Weight of the longer End. Then, by *Statics*, $a^2xd = a^2cd + b$. Solved, $x = \frac{a^2 - cd + b}{a^2d} = 55.0117$ Inches = Length, required.

Mr. Cartill makes the Length of the Lever = 28.29257, from a laborious analytical Process. Mr. Sanders finds 28.566592.

Mr.

Mr. Dutton puts x = required Length, in Inches, b = Weight of a cubic Inch of Oak, (found above = .53637 Oz. Avoird.) d = 56, m = 6, n = 8, then m^2x = Content in Inches, and m^2bx = Weight of that End; and,

by *Emerson's Mechanics*, P. 85, $\frac{m^2bx}{2}$ = Weight suspended at the longest End;

and, by *Laws of Mechanics*, $x : \frac{m^2bx}{2} :: n : d$, *invers.* whence $x = \sqrt{\frac{2nd}{m^2b}}$

= 6.81 Inches Length, required, (a Specimen of his Talents in Mechanics); instead of 5; Inches. So the Reason of this Correspondent's not turning general Equations (not to be depended on) into Numbers is evident, as it saves the *Discovery of his Error*. We have turned his Equations, *unsolved*, into Numbers for him, and it shews how much his reasoning is to be depended on, who is here quite thrown out of the Course, and is generally distanced by Truth.

XXIV. QUESTION 630, answered by Mr. Robinson.

PUT p = Sine, $16^\circ 21'$, Sun's Declination, x and y the Sine and Cos. Altitude, and Azimuth, from the South.

By *Spherics*, $y^2 + x^2 = p^2$; but $y^2 = 1 - x^2$; $\sqrt{1 - x^2} = p - x^2$. Whence $x^6 + 2x^4 - 3 + 2p \times x = p^2 - 1$. Solved, $x = .75215$ = $48^\circ 46'$, the Latitude, Sun's Altitude, and Azimuth; being at 12 Minutes past 10 in the Morning, and 48 Minutes past 1 in the Afternoon. W.W.R.

Mr. George Eyre's Solution.

DEAR Polly, observe well the Rules here below,

And the Method to answer your Question they'll shew.

Put $x = a$, = z , = Sine, Latitude, Altitude, and Azimuth, from N. respectively; then y = Cos. of each, d = Sine of the Sun's Declination:

Then, $x = a = z$, *per Quest.* By *Spherics*, $\frac{ax - d}{y \sqrt{1 - aa}} = z$. And, by

substituting for the Values of y and a , we have $\frac{xx - d}{1 - xx} = \sqrt{1 - xx}$. Re-

duced, we get an Equation of the 6th Power, (or it may be found by Trial and Error from above,) whence $x = .7528$, &c. = Sine $48^\circ 50'$, the Latitude, Altitude, and Azimuth, from the South. And, by *spherical Trigon.* the Answer comes out nearly $2^h 4^m$ Afternoon, and $9^h 56^m$ Morn. the Times of Observation required. — Plaudite, *Maria Stowe*.

XXV. QUESTION 631, answered by Mr. Geo. Eyre, the Proposer.

I find the Azimuth from North, on the Day when the Sun will be in the Tropic of Cancer, in Lat. 20° , at the Hours of

Whence, it appears, the Azimuth increases till

between 2 and 3, in the Afternoon, and then decreases till Sun-Set.

To find when the Azimuth is a Maximum.

Put x = Sine Lat. 20° , y = Cos. v = S. Sun's Altitude, b = Cos. z = Azimuth from the North, when a Maximum;

d = Sine Sun's greatest Declination $23^\circ 30'$,

H 2

By

1 and 11,	$73^\circ 10'$.
at 10 and 2,	$77^\circ 20'$.
at 9 and 3,	$75^\circ 36'$.
at 8 and 4,	$74^\circ 38'$.
at 7 and 5,	$71^\circ 40'$.
at 6 and 6,	$68^\circ 10'$.

Sun set $67^\circ 59'$.

By *Spherics*, we have $ax \mp byz = d$; but $\sqrt{1-aa} = b$, and $\frac{ax-d}{y\sqrt{1-aa}} = z$, a Maximum.

In *Fluxions*, $xy \dot{v} x \sqrt{1-v^2} + \frac{y x v^2 \dot{v}}{\sqrt{1-v^2}} - \frac{dyv\dot{v}}{\sqrt{1-v^2}} = 0$. Reduced, $b = \sqrt{1 - \frac{xx}{dd}} = \text{Nat. Sine of } 59^\circ 4'$. the Sun's Altitude, when his

Azimuth is *greatest that Day*. Th. at $2^h 12^m 40^s$, past Noon, the Sun's Altitude being $59^\circ 4'$, the Sun's Azimuth, from the North, being a *Maximum*, will be $77^\circ 24'$; theref. the *Gnomon's* Shadow will go $77^\circ 24'$ Easterly, before it changes to go *Southwardly again*.

To the latter Part of the *Quest*. the Length of the *Gnomon's* Shadow, at Noon, (Sun's Altitude being $86^\circ 30'$.) will be

at $2^h 12^m 40^s$ past Noon, (Sun's Alt. $59^\circ 4'$.) *Gnomon's* Shadow $\left. \begin{array}{l} 1.468 \\ 14.338 \end{array} \right\}$ nearly $\left\{ \begin{array}{l} \text{Cube} \\ \text{Roots.} \end{array} \right. \left\{ \begin{array}{l} 1.1365. \\ 2.4320. \end{array} \right.$
Whence .11365 and 2.4320, *Ratio* of the vibrating Strings. W.W.R.

PRIZE-QUESTION (*possible*) is solved by Nobody.

THE *Bishops-Wearmouth* Author must therefore take the Trouble himself to solve it, or to find all the *perfect Numbers* to his 859 Octillions, instead thereof; which will intitle him to Applause for the Labour.

CORRECTIONS.

NEWTONIENSIS observes, that there are two wrong Solutions to two Questions. In the Solution to *Quest. IX. P. 48, Pall. 1778*, the *Rope* fixed to the Top ought to be drawn (he says) parallel to the Horizon, to pull the Cone ever with the *least Force*. In the Solution to *XIII. Quest. P. 50*, it is said the greatest Weight will be at the Center of the Earth; but, certainly, at the Center of the Earth the Weight is Nothing at all.

Mr. *Rich. Judson*, of *Beverley, Yorkshire*, observes, that Mr. *James* determines the greatest Weight, or Gravitation of a Pound Weight, to be at the Earth's Center, which is contrary to Sir *Isaac Newton's Principles*, where he treats on the Laws of Attraction of *Corpuscles*. For, as all Parts of the Earth attract each other, a Weight at the Earth's Center will be suspended, on all Sides, by *opposite Attractions*; and, therefore, the Weight of a Body at the Earth's Center will be Nothing. Consequently, the greatest Weight, or Gravitation, of a Body, must be at the Earth's Surface. But, as all Bodies, placed at the Earth's Surface, have a *centrifugal Force*, by the diurnal Rotation of the Earth, which Force decreases from the Equinoctial to either of the Poles, about which the Earth turns, it is evident, that the greatest Weight, or Gravitation, will be on the Earth's Surface, at either of the Poles.

In the Solution to *IX. Quest. 253, in Pall. 1778, P. 48*, Mr. *James*, by a *fluxionary Process*, determines the Angle the *Rope* (of greatest Force to overcome the Cone) makes with the *Axis* of the Cone $= 33^\circ 48'$, which cannot be universally true. For, if the Alt. of the Cone had been 6, and the Diam. of the Base 20, Feet, then the *Rope* would have fallen within the Cone's Base, which is an *Impossibility*. And, as the *slant Height* of the Cone approaches nearer to a *horizontal Line*, while the Diameter of the Base increases, and Altitude

titude decreases, the Angle that the Rope must make with the Cone's *Axis*, when fixed to the *Vertex*, cannot be less than a right Angle.

Again, suppose the *Rope* was fixed to the *Vertex* of the Cone, so as to make an Angle with the *Axis* greater than a Right-Angle, then some Part of the Force applied by the Rope would be destroyed by acting contrary to the Force of Gravity; and, if the Angle of the Rope, at the *Vertex*, with the *Axis*, were less than a Right-Angle, Part of the Force would be taken off by the Resistance of the Cone's Basis; so that the Angle of the Rope and Cone's *Axis* must be a Right-Angle, or the Rope must draw with a Force, parallel to the Horizon. And so, in drawing all the other Objects, (a Boat's Mast, &c.) to compel them to move with least Resistance.

N. B. This is against Mr. Dutton's Position of making the Rope draw an Angle with the Cone's *Axis* of 45° ; who admires mechanical Subjects beyond Others. — We admire Truth only.

Mr. Judson sends, for the Truth, as follows: As the *Solutions to Quest.* 395, P. 49, *Pal.* 1778, all differ; and the Meaning of the *Quest.* has not been properly explained, I here send my Solution.

The *Question* amounts to no more than this. *In what Time will an Annuity of 1 Shilling a Week pay off a Bond Debt of 52 l. at 5 per Cent. per Ann. simple Interest?*

PUT $e = 1$ Shilling, $P = 1040$ Shillings, $r = \left(\frac{.05}{52}\right) .000959$ equal Time required.

By Case the 1st, P. 432, *Practical Arithmetician*, $te + \frac{t^2 - t}{2} \times er = A$ — amount of the *Annuity*, for the Time t ; and, by Rule 1, p. 329, $Prt + P =$ Amount of 52 l. for the same Time; which, consequently, must be equal.

Th. we have $te + \frac{t^2 - t}{2} \times er = Prt + P$; then $2te + t^2er - ter = 2$

$prt + 2p$; and $t^2 + \frac{2t}{r} - t - \frac{2pt}{e} = \frac{2p}{r}$; put $\frac{2}{r} - 1 - \frac{2p}{e} = 2m$;

then, by Substitution, $t^2 + 2m = \frac{2p}{er}$; solved $t = \sqrt{m^2 + 2\frac{2p}{er}} - m =$

1475.76 Weeks = 28.38 Years, nearly, agreeing with Mr. Rowbottom's Solution.

Richard Judson.

N. B. Correcting of *public Error* should not give Offence to our Correspondents, since corrected *Error* is established Truth, doing Honour to Science and each Corrector.

We wish our Correspondents would send us *Queries* of Use, to be resolved, and not Trifles without Weight, to publish, we mean not to send such as contain neither *Curiosity* nor *Instruction*, to answer. To know the Reason why most People generally begin with the Right-Foot in ascending a Flight of Stairs; which may be resolved into *Custom*, the same as being right and left handed. When People do for the best they are generally allowed to put the right Foot foremost. Another would know why a *Cuckold* is said to wear Horns, perhaps for Defence; how Men can win Wagers by Sleeping? being *Gotbam* Queries and Paradoxes. We cannot imagine that *Socrates* or *Plato*, renowned for their Wisdom, ever proposed *Queries* of this Kind. Nor would such Propositions bear debating in the Houses of Parliament. We have some other *Gotbam* Queries and Paradoxes, which

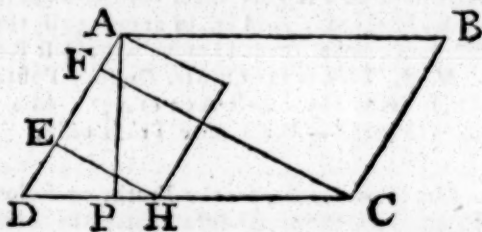
which we cannot admit into a *Palladium* of Science. Whatever, before, has been inadvertently admitted,

Mr. Mouldale's Revise of his Solution to Question XVII. P. 54, Pall. 1777.

AS there is Disagreement between Mr. *Lamb's* Solution and mine, to *Quest. XVII.* Page 54, *Palladium*, 1777, I here give the Solution at Length, to prove the *Question* is not ambiguous; shewing, at the same Time, the Truth of my last Solution.

Put the Diameter $PA = y$:
 $AE = x$, Radius (1) the Angle

$D = 60^\circ = \sqrt{\frac{3}{4}}$. $\angle DAP =$
 $DCF = \frac{1}{2} \cdot 7854 = c$ and $AB =$
 $2y$ (per *Quest.*) And, by *Trig.*
 $\frac{1}{2} : 1 :: AB : DC : DF = y$. A-
 gain, $\sqrt{\frac{3}{4}} : y :: 1 : \frac{y}{\sqrt{\frac{3}{4}}} =$



$\frac{2y}{\sqrt{3}} = AD$; and $AD - AE = DE = \frac{2y}{\sqrt{3}} - x$; also $1 : 2y :: \frac{\sqrt{3}}{2} : y$

$\sqrt{3} = FC$. By similar Angles, $DF : FC :: DE : EH = 2y - x \sqrt{3}$, and $EH \times$
 $A^2 \times c = \text{Content of the Cylinder} = 2y - \sqrt{3} x^2 \times x^2 c = \text{a Maximum,}$

(by *Quest.*) Put $\sqrt{3} = b$. In Fluxions, $4cyx\dot{x} - 3bcx^2\dot{x} = 0$; for the
 Diameter of y is staple. Therefore $4y = 3bx$, (the *Theorem* in my last); put
 this Value of y , in the Equation, $2y - bx \times x^2 c$, and we get $\frac{3bx}{2} - bx \times$

$x^2 c = 56.2789$; whence $x = \sqrt{\frac{3 \cdot 71.66}{.864}} = 4.359 = AE$, and $y = AP =$

5.6579 , $AB = 11.3159$, the Altitude $EH = 3.766$, being the only true *Sol-*
ution that can be given. W.W.R.

Old-Street, London, March 30, 1778.

Joseph Mouldale.

Mr. *Eyre*, of *Castleton, Derbyshire*, observes, that Mr. *Marsden's* Answer to 602 *Quest.* is, in some Parts, erroneous, and that he has given no Answer to other Parts. Where he says, the Breadth of a Wave or Pulse of Air, of the Strings sounding C and A, is .775 Decimals; but whether Yards, Feet, or Inches, he takes no Notice; nor whether it be of the Pulses of C or A; for it cannot be both. The Breadth or Pulse of C he affirms is 4 Feet 2 Inches; and of A, 2 Feet 6 Inches nearly.

Mr. *Marsden* says that a Cycle of the Pulses is 2430090. Mr. *Eyre* finds it to be 312970 Vibrations, nearly.

As to the Length of the Periods, Mr. *Marsden* (he says) is silent; nor says what must be the *Temperament* of such 6th *Sharp*, to make the *Cycles* and *Periods* of the same Length, as when tempered flat.

He observes that Mr. *James*, in his Answer to *Quest.* 507, makes the greatest Weight of Gravitation of 1 lb. to be at the Earth's Center. But he farther observes, that Mr. *Emerson*, in his Fluxions, Prop. X. Corol. 2. says, "The Force wherewith a Corpufcle, within a Sphere, is attracted to the Center, is, accurately, as the Distance from the Center." Consequently, the

the Attraction decreases from the Surface to the Center; and, therefore, is greatest at the Surface. See also *Newton's mathematical Philosophy*, demonstrated by *Whiston*, Prop. 47, where he shews that a *Corpuscle*, within a Sphere, is attracted with a Force proportional to its Distance from the Center. *G. Eyre*.

It were to be wished that our ingenious Correspondents would well consider the Truth of what they send us to be published, to prevent Mistakes or Errors, and the Trouble of Correction. For we cannot detect Error at first Sight.

IMPROVEMENTS.

XVI. QUESTION 600, by *Mr. Chipchase*, of *Stockton-upon-Tees*, explained and answered by the *Palladium-Author*.

The Inconsistency of this Question, as printed, was rectified to the *Palladium-Author* by a very able Mathematician, lately, as follows.

Required what Rhumb Line goes twice round the Globe, between 60° and 70° Latitude, and what Parallel does it cross at going once round?

As the Meridian Diff. Lat. (between 60° and 70° ;) to Radius, so Diff. Longitude of twice 360° , or 43200 Miles, to the Tangent of the Course.

Mer. Pts.

Latitude 60° } 4527
 70° } 5966

As Meridian Difference — 1439 — — — — — *Logarithms.*
 3.1580608

To Radius — — — — — 10.0000000

So the Difference of Longitude 43200 — — — — — 4.6354837

To Tan. Course $88^{\circ} 5' 31''$ — — — — — 11.4774229

As Tang. Course $88^{\circ} 5' 31''$ — — — — — *Logarithms.*
 11.4774229

To the Difference of Longitude $360^{\circ} \dots 21600$ — — — — — 4.3344538

So Radius — — — — — 10.0000000

To the Meridian Difference of Latitude — 719.5 — — — — — 14.3344538
 at one Revolution. 2.8570309

Mer. Pts.

Latitude 60° — — 4527

Add — — — — 719.5

Latitude $65^{\circ} 28' + 5246.5$

} Hence, at the first Revo'tion, the Rhumb-Line crosses the Latitude $65^{\circ} 28'$, +.

Mr. Judson, of *Beverley, Yorkshire*, sent his correct Solution, agreeing with the foregoing, and therefore confirms the Truth of each other.

N. B. The Author of the above Question, inconsistently proposed, at first, by him thus: *What Parallel does the Rhumb-Line cross after one Revolution?* Instead of *at one Revolution*; for it may cross an infinite Number of Parallels after, as are between the Place of crossing, and 60° or 70° Latitude, either Way, moving from one Latitude to the other, and the Word *twice* (revolves twice) was omitted, and not corrected by himself for the whole Year, 1777. Had he understood what he meant, and could have answered the Question, it is presumed that he would have corrected the printed Inconsistencies, and given an Answer himself, when he found his Question unintelligible to every Correspondent; and that no one could answer it. His pretending, to an eminent Mathematician,

Mathematician, that he had sent us a *Solution* with the Question, (asking him how many Answers we would have,) was to excuse himself, by throwing the Blame on us. For we solemnly deny receiving any Answer. Had we received one, we should certainly have printed it, and the Corrections of the *Inconsistencies* together, in last Year's *Palladium*. — He should go to School.

Mr. *Emerson's* Adversaries have asserted many false Things to screen their Ignorance and Presumption, in meddling with what they did not understand; but have thereby rendered themselves the more contemptible! *School Boys* might as well take their Teachers to Task, as Pretenders to set up for Critics on Subjects they do not understand, who deserve to be treated cavalierly.

We admire and respect Men of *real Science*, and Truth, as much as we dislike Pretenders.

Mr. *Judson*, having accurately confirmed the foregoing Solution, he sends a *Continuation* of the same, as follows:

To find the Distance sailed, in going twice round the Globe.

As Rad. : to Dif. Lat. 600 Miles :: Sec. Course $88^{\circ} 5' 31'' .68$ } 18022.30158
As Cos. Course : Radius :: Diff. Latitude, . . . } Miles, sailed,

To find the Distance sailed in going the first Time round the Globe.

Miles.

As Cos. Course : Rad. :: Dif. Lat. 328^m :: 9852.191527 , sailed in going the first Time round.

----- 272^m :: 8170.110047 , sailed in going the second Time round.

Sum 18022.301574 = the whole Distance.

Proof. As Rad. : Merid. Diff. Lat. 1439^m :: Tang. Course $88^{\circ} 5' 31'' .68$: 43200^m Diff. Longitude.

N. B. To prove the foregoing Accuracy, Mr. *Judson* has used Logarithm-Tables to ten correct Places, or *Ularque's* Logarithms.

He farther continues his accurate Computations, in determining the Distance sailed twice round, between the Equator and 10° Latitude, and also between 75° and 85° Latitude.

From the Equator to 10° Latitude.

In this Case. Nat. Tan. Course = $\frac{43200}{603} = 71.64179 = 89^{\circ} 12'$, (nearly)

Course; then, as Cos. Course : Rad. :: Diff. Lat. 600^m : 42973 Miles; something less than twice the Circumference, at the Equator, in sailing round, between the Equator and Latitude 10° .

From Latitude 75° to 85° .

In this Case. Nat. Tan. Course = $\frac{43200}{3795} = 11.3834 = 84^{\circ} 58'$, the

Course. Then, as Cos. Course : Rad. :: Diff. Lat. 600 : 5937 Miles; which is not a third Part of the Distance sailed, as by the Question. R. *Judson*.

To the Palladium-Author.

A Question was proposed in the Whitehall Evening-Post, in April last, (1778,) to know the Reason why Easter-Day was not on Sunday, the 12th Day of April, 1778, (instead of the 19th,) as the full Moon next after the 21st of March, happened on Saturday, April 11, at 8 in the Evening.

It

It was answered in the same Paper, Number 5005, from the *Royal Astronomer*, in the Name of *William Large*, King's Coffee-House, *Hull*, concluding thus. By the *astronomical* Day the full Moon happened on the 12th Day, and 8 Hours, which was Sunday.

Another Question was started in the same Paper, Number 5014, as follows: Allowing *Mr. W. Large's* Solution of the Fall of *Easter*, 1778. to be true, *Quere*, would the same Sunday have been *Easter-Sunday*, if the full Moon (true or mean) had happened 8 Hours sooner, when the Sun was on the Meridian? Also, when will *Easter* full Moon happen on Saturday, at 12 at Noon. Signed *Hydra*

Beverly, June 23, 1778.

RICHARD JUDSON.

Answer to the above Questions by the Palladium-Author.

The true astronomical full Moon happened upon Saturday, April 11^d 8^h 22^m Afternoon, (see P. 4, *Pall.* 1778.) and the mean astronomical full Moon happened on Saturday, April 11^d 11^h 1^m 54^s, Afternoon, (see Tab P. 385, *Royal Astronomer*,) and not on Sunday, April 12, at the said Times. The astronomical Day always beginning at 12 at Noon. But, when the Government altered the *Stile*, (ordering the 3^d to be called the 14th of Sept. N. S.) it was found too difficult to determine the Time of *Easter*, by either the true or mean full Moon that happened next after or on the 21st of March, (the near Time of the *vernal Equinox*,) when they ordered a *plain, easy*, and *near*, Rule, (as in Tab. P. 70, *Pall.* 1752, improved as in *Royal Astronomer*. P. 154.) for determining *Easter* and the full Moon, by shifting the Golden Numbers to different Days of the Month to those against which they stood in the *Bible Calendar*, whereby every Person might find, without Trouble, the *Easter* full Moon.

But this near and easy Rule sometimes deviates from the Truth, of the mean or true full Moon, 1 Day, (and so in the Moon's Age,) as the mean full Moon deviates from that of the *Stile-A& Easter* full Moon frequently, by above half a Day. Hence, the *Easter* full Moon, by the Government's Rule, falls on Saturday, April 12, a Day later than the true or mean full Moon, happening on April 11, 1778 (next after the 21st of March,) whereby *Easter* falls on the Sunday following, April 19, the Sunday after, instead of on Sunday, April 12, as it would have fallen by the true or mean full Moon happening on April 11, not included in the Rule of the *Stile-A& Easter*. From this Difference of 1 Day, between the Time of *Easter* full Moon, by the *Stile-A& Easter* Rule, and the Time of true or mean astronomical full Moon, a Week Difference in the Fall of *Easter* must frequently and necessarily happen, as in 1778; especially when the *Stile-A& Easter* full Moon happens later than the true or mean full Moon.

To the 2^d Question, not allowing *Mr. Large's* Solution to be true, but largely wide of Truth, (for the *Stile-A& Easter* full Moon happening on April 12, astronomical Time, but the true or mean full Moon on the 11th, astronomical Day, at Night,) is answered yes; because the true or mean *Easter* astronomical full Moon alters not the Time of the *Stile-A& Easter* full Moon.

When will *Easter* full Moon (*Stile A& Easter*) happen on a Saturday? See Tab. P. 154, *Royal Astronomer*, for several ready Answers, by the Golden Number, Dominical Letter, and advance Days, of the lunar Cycle, for particular Years. The true and mean full Moons have Nothing to do with the Fall of *Easter*; but only the *Stile-A& Easter* full Moons.

It is of no Consequence to the Public whether the *Stile-A& Easter* makes *Easter* fall a Month (instead of a Week) sooner, or later, than according to the Time of the true or mean full Moon, happening on, or next after, the 21st of March.

The vernal Equinox, at the Council of *Nice*, happened on *March* 20^d 11^h 25^m, in the Forenoon, according to Dr. *Halley's* Tables; which, among Astronomers, is on *March* 19^d 23^h 25^m, P. M. (nearly on the 20th Day,) and not on *March* the 21st, as by Error established.

N. B. Mean new Moon, 1779, (by Tab. P. 38c, *Royal Astronomer*,) happens *March* 31^d 19^h 50^m 30^s, wanting 4^h 9^m 30^s of *April* 1, when the *Stile-Act* full Moon happens, 1779.

PALLADIUM-AUTHOR.

If our Correspondents send us any more of their Deductions, without Numbers, to prove the Truth of their Conclusions, they will be unnoticed. We are sorry that one Correspondent still persists in sending us *inconsistent Questions*; particularly one in Navigation, giving us much Trouble to examine the Inconsistency. First, his inserting the Longitude of *Jamaica* 281° 29', and then demanding (from an untrue Idea, and against Practice) the Course to go the Voyage, in the *shortest Time*, through a Current, without limiting its Rate of running, and where it begins and ends, or where the Rate of Sailing begins and ends, and the Course steered at the different Rates of Sailing; which, being all Confusion, he would do better to send such *Improprieties* to be examined elsewhere, and made consistent before sent to us. What is of Use is only acceptable. If he reads Mr. *Judson's* reasoning, on fixing a Rope to draw *horizontally*, he will give up his accustomed Error of fixing it to a Vessel's Mast, at an Angle of 45°, to tow a Vessel with the greatest Force, or least Resistance. If he will send us Error, it must be detected and rejected. We have Nothing to do with his, or any other private Person's, Doubts and Conjectures, nor with the Emigrations of the Mind. We only require what is entertaining, curious, true, and useful, in Science: Wrangling Subjects being beside our Purpose.

* * * The Rev. F. *Holiday*, Vicar of *West-Markham* and *Bothamstall-Nott's*, has published *An Introduction to Fluxions*, designed for the Use, and adapted to the Capacities, of Beginners. Who is Author of a *Treatise of Fortification and practical Gunnery*. — Sold by Mr. *Nourse*, Bookseller to his Majesty, in the *Strand*.

NEW ÆNIGMAS.

I. ÆNIGMA 295, by Mr. William Marsden, of Netherhurst,

WHEN glorious Sol, great Ruler of the Day,
Through sultry Cancer takes his radiant Way;
When bounteous Nature in her Pride appears,
And flow'ry Fields a pleasing Prospect wears;
For great Exertions then I am brought forth,
And former Deeds declare my well known Worth.
If *Colin*, arm'd with me, but takes the Field,
By him impell'd, I soon make Thousands yield:
Not young, or old, that come within my Pow'r,
Can gain a Respite for a single Hour.
A near Relation I am to an Elf,
Of Pigmy-Size, compar'd unto myself;
With such a Set of Teeth, I will maintain,
That all within his Grasp he bites in twain:
Though I destroy, I'm never cruel thought,
For my Assistance, ev'ry Year, is sought.

By

By me the Farmer does great Profit make,
 Though, in the Contest, I make his Shoulders ache;
 For gen^lal Good, I my Assistance lend,
 To King and Country am a steady Friend!

Ans. Scythe

II. ÆNIGMA 296, by Mr. John Sharman, of Biteswell, Leicestershire.

YE riddling Artists, Attention pray lend,
 Survey the Dimensions and Parts of a Friend;
 It is known I'm compos'd of both Wood and of Leather,
 And my Arm and my Entrails are both join'd together;
 The Shape of my Body is slender and tall,
 If you lift up my Arms then my Entrails down fall,
 My circular Mouth is but awkwardly plac'd,
 A Yard from my Head, in the Midst of my Waist;
 With strong Hoops of Iron my Joints are all bound,
 In the Middle they're square, at the Ends they are round.
 The rich and the poor on my Service attend;
 To the grave and the gay my Assistance I lend:
 I'm often performing of wonderful Deeds,
 For, out of my Mouth, my great Bounty proceeds.
 Whole Towns I've preserv'd from Destruction and Woe,
 Which many, now living, all very well know.
 But, though I'm so useful throughout the whole Year,
 No tender Compassion e'er falls to my Share.
 In hot sultry Weather, or cold Frost and Snow,
 No Cov'ring have I, and no Shelter I know:
 Quite diff'rent am I to all Creatures, I say,
 For all that I do is by *vice versa*.
 I receive at the Mouth, and then cast out below;
 But all that pass through me quite upwards do go.
 Consider my Form, and discover my Name,
 And be ye enroll'd in the Temple of Fame!

Ans. An Engine

III. ÆNIGMA 297, by Mr. F. Turner, of Lechdale, Gloucestershire.

I, from the deep Recesses of the Earth,
 Through gloomy Caverns, claim my rugged Birth:
 Rough and unpolish'd I at first appear,
 But am refin'd and form'd with greatest Care.
 Although I pass through *Vulcan's* flaming Fire,
 And bear his Indignation and his Ire,
 In various Colours I am often seen,
 Black, yellow, white, red, purple, blue, or green;
 In diff'rent Forms I frequently appear,
 Both round and square, but not triangular:
 To Male and Female I'm a constant Friend,
 And do, to each, my free Assistance lend.
 I frequently attend the Belle and Beau,
 At Balls, or Playhouse, when they choose to go.
 But though I lifeless am, I oft am fed,
 And I revive, and feed the human Head.
Palladium Artists be not in Surprise!
 Reveal my Name, uncover my Disguise.

Ans. Box

IV. ÆNIGMA 298, by Mr. John Needham, of Hinchley, Leicestershire.

Come, Artists, view my Snow-white Back,
 My Ribs I plainly shew;

Both Head and Tail, and Legs I lack,
Yet I'm carest by Belle and Beau!

V. *ÆNIGMA 299 by Mr. William Dutton, of Northwich, Cheshire.*

LET not my mystic Properties surprize,
Which I shall now discover to your Eyes!
Honour and Dread, Love and Tranquillity,
Should ev'ry one, you say, unire in me.
But first, likewise, I from my Mother's Womb,
Like other Folks, into the World do come.
Farther advanc'd in Years, I learn the Rules,
Such as are common in the classic Schools.
In public Character I then am found,
Amidst the gazing Multitude around;
Seated on high, and cloth'd in purest white,
And, by and by, in black attract your Sight.
Most dreadful to relate, but Truth to tell,
My Friend is *Satan*, and Support is *H-ll*.
O rigid Fate! not such you'll find my Cafe,
Yet all my Study is a better Place.
To bless Mankind is still my common Task,
O Heav'ns! but grant it, and no more I'll ask:
Such Benefit the Law to some does give,
As none beside did ever yet receive.
As at your last, the tolling Bell does say,
Come Home, dead Body, to your Bed of Clay;
So I am summon'd, by the tolling Bell,
To meet the Grave, while I'm alive and well!
I only this can add, my Precepts try,
And they will teach you how to live and die.
Don't do as I do, but do as I say
And you will soon my Principles display.

Clergy-man.

VI. *ÆNIGMA 300, by Mr. Swift, of Stow.*

LADIES, a Fav'rite I appear,
And your dear Hands I kiss, ye Fair!
My Shape's an oblong, seen to be,
And Drefs is handsome, you'll agree;
I'm creff'd in red, with spangled Gold,
And hence my Name you may unfold.
In Mourning I sometimes am clad,
But never known to do what's bad.
The Title that I with me bring,
Makes me receiv'd, ev'n by the King.
All Ranks with me, it is well known,
Have bent, submissive, lowly down.
When Virgins with me come before
Hymen, they blush; — I'll say no more.

Gloves.

VII. *ÆNIGMA 301, by Mr. John Abbot, at Mr. Cole's, Fleet-street, London.*

I all discover, all confute,
Yet Nothing I molest;
From me all Things receive their Doom,
Therein I am confess.

No End to me you e'er will see,
 For deathless is my Fame;
Palladium-Artists, then agree,
 And tell the World my Name.

VIII. ÆNIGMA 302, by Mr. Abbot.

TWO Legs I've got, which never walk on Ground,
 But, when I walk, or run, one Leg turns round.

IX. ÆNIGMA 303, by Mr. Isaac Gumley, of Countesthorpe.

ÆNIGMATISTS, examine Nature,
 And strive to find an odder Creature.

I, like the fabled Unicorn,
 Am seldom seen without a Horn;
 Nor has it ever once been known,
 That I was grac'd with more than one.
 A Tail I have of wond'rous Length,
 Though little noted for its Strength;
 Through which, my Friends, you'll always find
 A constant Passage for the Wind.
 My Head and Tail are join'd together;
 And Eyes and Ears, — I ne'er had either;
 Nor Legs, to move from North to South,
 Yet I possess a monstrous Mouth;
 In which, should you but put your Finger,
 You may for long in Torments linger.
 When round the social Board you sit,
 Displaying all your Mirth and Wit,
 Or chatting over News and Science,
 And bidding fretful Care Defiance;
 Then I, to make you still more pleasant,
 Am almost always with you present.
 Old *Will* and *Joan*, his loving Wife,
 Allow that I can sweeten Life;
 And that old pettish Maid, *Sal Horner*,
 Delights to have me in a Corner;
 For she would not, if it would save her,
 E'er have you know how I'm in favour.
 But soon, alas! my Days are o'er,
 And I'm carest and lov'd no more;
 And, like the short-lived human Race,
 I've quickly one to fill my Place.
 While I (so Merit's oft rewarded)
 Am thrown aside, and disregarded:
 There, O ye thoughtless Sons of Mirth,
 I mingle with my Mother Earth.
 A Moment endeth all my Fame,
 And Time dissolves my brittle Frame.

A Tobacco-pipe

☞ Those who send the best versified Answer to the following ÆNIGMA, before Candlemas-Day, have a Chance, by Lot, to win 5, 4, and 3, Prizes Palladiums.

PRIZE-

PRIZE-ÆNIGMA, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

YE Bards, that grace *Britannia's* fertile Plains,
And sweetly sing in soft *Sicilian* Strains,
O deign, awhile, my artless Tale to hear,
And let me once in Masquerade appear.
I am no Monster, of gigantic Size,
With wide devouring Jaws, and flaming Eyes!
Nor tiny Fairy, frisking o'er the Green,
In swift Obedience unto *Mab*, the Queen;
But I'm your Friend in many diff'rent Ways,
I watch your Movements, and I count your Praise;
Instruct you how to shun the Paths of Shame,
And, by your Deeds, acquire immortal Fame!
In Robes of Innocence behold me drest,
And not a Spot becloud my copious Vest;
View me again, and you'll, without Affright,
Behold me darksome as the Shades of Night.
Thus, when the Sun appears, all Nature's gay,
But sable Night succeeds the cheerful Day.
When, to my Seat, in solemn Pomp, I come,
All Eyes are fixt, and Music shakes the Dome.
On me the num'rous gazing Crouds attend,
And Princes, Lords, and Clowns, before me bend:
Some, by their Looks, betray their inward Fear,
Heave high the Breast, and shed the silent Tear;
Remorse and Guilt, with their ten Thousand Stings,
Exert their Pow'r, and vex the Souls of Kings.
Some smile, serenely, as the Summer's Morn,
And inward Joy does all their Looks adorn;
While some in loose Indifference remain,
And think of Subject idle, pert, and vain.
At rural Weddings I perform a Part,
And add a Joy to ev'ry Rustic's Heart:
John and his Spouse, of Humour kind and free,
Confess they owe their Happiness to me.
In mournful Scenes I often, too, am found,
When Death, with sable Wings, comes hov'ring round;
Where loving Friends expect departing Sighs,
And Sorrow sits and wipes her weeping Eyes,
I use my Skill, and stop immoderate Grief,
And pour in Balm to give their Souls Relief.
Now tell my Name, ye Swains enrich'd with Lore,
And Fame shall sound your Praise from Shore to Shore!

NEW QUERES.

I. QUERY 282, by Mr. John Abbot.

WHY there are less Foxes than *Sheep*, as a female Fox has generally five at a Litter, and a *Sheep* seldom above one.

II. QUERY 283, by Mr. John Abbot.

A Reason plain afford to me,
Why *Sun* and *Clocks* should disagree?

Why

Why Clockstoo *fast* or *slow* appear,
Except on *four* Days in each Year?

III. QUERE 284, by Mr. Simpkin, of Finedon.

WHO were the first Discoverers of the medicinal Efficacy of *Quicksilver*, and in what Year?

IV. QUERE 285, by Mr. Ralph Dutton, of Northwich.

TO explain the Nature and Cause of a Voice repeating so frequently in the Whispering-Gallery, at St. Paul's, London?

V. QUERE 286, by the same Correspondent.

TO explain the Nature and Cause of Whirlwinds, Hurricanes, and Earthquakes?

V. QUERE 287, by Mr. G. Simpkin, of Finedon.

SHOULD Fate but change the rich to poor,
Would not their Honour be no more?
If so, the Myst'ry pray explain,
Who gets the Honour, Money or Men?

VI. QUERE 288, by Mr. Swift, of Stow.

IN what Sense is Sleep interpreted to be the Image of Death?

VII. QUERE 289, by Mr. Swift.

WHAT was the Value, in *English* Currency, of the Field, Cave, and Treas, which *Abraham* bought of *Machpelah*, mentioned *Gen. xxiii. 15*.

VIII. QUERE 290, by Mr. Swift.

IN what Year was a Shilling first coined, and what was its original Value? In what Year was the Engine made for coining it, and by whom invented?

IX. QUERE 291, by Mr. Swift.

IN what Year was the Island of *Madeira* discovered, and who was the Discoverer?

X. QUERE 292, by Mr. W. Turner.

QUOMODO physica explicas Causam Spasmi Musculorum?

XI. QUERE 293, by Mr. Turner.

NOTA est mihi Mulier, cujus Oculi differenter apparent, Colore, unus splendidus. alter obscurus; cupis, igitur, mihi communicabis quid Docti consentanei, de hoc Re sentiunt?

XII. QUERE 294, by Mr. Robert Tyrrell Heath.

THE Property of the following *Latin* Verse being disputed by some, the Construction thereof is required.

Disce Pœta bonum quem Carmen scripsit Homerum.

XIII. QUERE 295, by Mr. Robert Tyrrell Heath.

WHAT Reason can be assigned for 2 *Kings*, Chap. xx. and *Isaiab*, Chap. xxxviii. being so nearly alike?

XIV. QUERE 296, by Numericus.

THE least of all Numbers, that cannot be less,
And Beginning of Magnitude, what will express?

XV.

XV. QUERE 297, by Mr. Miles Merit, practical Measurer and Land-Surveyor, at Winchester.

WHY is ignorant *Presumption* and unabashed *Confidence* compared to *Brass*? And whether a common *Deceiver*, to the Prejudice of an innocent Person's Property, a common *Thief*, or a common *Liar*, is the most detestable and odious Character?

XVI. QUERE 298, by Honestus, of Hampshire.

WHETHER taking-in a Number of Subscribers, by Means of a fallacious *DECEIT*, for any pretended *Work*, never designed to be published, by any Person, deficient in *Principle* of Justice, and Ability, to publish it, is not similar to what is usually termed *Swindling*, or acting the Part of a *Swindler*? Or with what other *Similitude* will it correspond?

XVII. QUERE 299, by Monitor.

WHETHER a Collector of a *Turnpike*, forfeiting his Character, or a Collector on the Road, are the more eligible *Callings*, or *Denominations*?

XVIII. QUERE 300, by a Hampshire Archibite.

WHEN will the *Practical Measurer and Land-Surveyor*, or a new *Improvement in Mensuration*, by the Measurer of Timber as it grows, be published? Printed Proposals, for publishing the same, by Subscription, being distributed about a Year and a Half ago, and 2s. 6d. collected from a Number of Subscribers, paying Half a Crown to the Collector of Subscriptions, pretending to publish the said Work *SHORTLY*, and to receive another Half-Crown on the Delivery. *Quere*, the Idea annexed to *shortly*, in the said Proposals?

N. B. *Some Years ago*, a curious *Work*, intitled the *Uranographia Britannica*, as a *correct Situation of all the Constellations of the Heavens*, with the *correct Latitude and Longitude of each Star included in each Constellation*, was pretended to be published, by a couple of *Star-Mongers*, (a *Doctor*, of *Brazen-Nose College*, and a *Watch-Maker*,) Takers-in of the Public, for two Guineas from each Subscriber to that pretended excellent *Work*, with but two or three *Copper-Plates* ever finished; and those *incorrectly*. The Consequence was, that a very large Subscription was raised, and paid into the Hands of the Swindlers, by several Persons they artfully deceived, (the *Palladium Author* for one.) to be their Receivers, in Hopes of seeing so perfect a Performance finished as was wanted; but the Project ended in a Fraud, by the Projectors; who both died, ignominious Bankrupts, and despicable Pretenders, unpitied!

XIX. QUERE 301, by Detector.

UPON what Principle is the *Tontine-Scheme* in Ireland, founded, paying 6*l.* Annuity during a Person's Life, and so in Proportion, for sinking 100*l.* when, if the Debenture Receipt happens to be lost, or mislaid, specifying the Sum put into the Fund, and sunk, for the Use of the Founders, or Proprietors, of the Scheme, shall they refuse to pay the agreed Annuity for the Person's Life, they entered in their Books, and are conscious they received?

PRIZE-QUERE, by Publicus.

ON what Principle is the 3 per Cent. consolidated Bank Annuity, and other Bank Stock, founded; when, in about a Year and a Half, 100*l.* Annuity, or other Stock, purchased for 86*l.* shall sink in its Value, in selling out, to 62*l.* at the Loss of 24*l.* to the Owner, for the Distance of Interest allowed: Being like a little Fish put upon a Hook to catch a great one. Whereas all Securities ought to be for the invariable Property, or Principal, deposited:
Though

Though at ever so low an Interest for the Service and Use of the Owner, or Depositor, of Cash, as his Occasion shall require to refer to the Principal.

Instead of which, the *Money-Hunters* (whose Souls are absorbed in Money) are daily running to 'Change after the *Stock-Jobbers* and *Stock-Brokers*, to buy *in*, and sell *out*, as they make the Value of the variable Stocks rise and fall: Who are like the *knowing Ones* at *Newmarket*, after whom the *London Sharps* and *Takers-in* sneakingly go down, to go Snacks, in a Bite or a Bet. What Sort of People, in general, are these to be deemed in a Community? And what are their respective Merits?

NEW REBUSES.

I. REBUS 274, by Mr. John Abbot.

TO the Thing that can Ladies Hearts fire,
Add the Force of the Marriage Bond;
And a Charm you will see, all admire,
And of which all the World are so fond!

II. REBUS 275, by Mr. Abbot.

TO that which is scarce the World round,
Join that which oft crosses the Main;
A Jewel from thence may be found,
Which you never should part with again;

III. REBUS 276, by Mr. George Simpkin, of Finedon.

WHAT excites Men to move, and Part of a Bear,
Exhibit a Nymph with a delicate Air.

IV. REBUS 277, by Mr. Thomas Smith, of Lamberhurst, Kent.

AN industrious Insect, to a rough Month when join'd, *Marchant*
Will shew you a Nymph of an excellent Mind!

V. REBUS 278, by Mr. W. Swift, of Stow, near Lincoln.

FIVE Hundred cut off, from the Name where you dwell,
What remains will a Place of cold Residence tell.

VI. REBUS 279, by Mr. Swift.

IF you a Cipher take away
From a Beast's Name that eateth Hay,
'Twill tell, exact, the Time of Day,
And when my Fair was at a Play.

VII. REBUS 280, by Mr. Swift.

THE Head of a Drum taken off, you will see
What I drank, that delighted my Charmer and me.

X

Rum.

VIII. REBUS 281, by Mr. John Needham, of Hinchley, Leicestershire,

TO the Staple of England, a wicked Hag join,
And a Place, known for Thunder, in Kent, you'll define. *Wolwich*

IX. REBUS 282, by Mr. Penn, of Chalfont, Bucks.

A hallow'd Dome, and Reverse of a Dale,
Will the Name of an eminent Poet reveal.

X. REBUS 283, by Mr. Turner, of Witney.

WHERE Soldiers reside, and where Lions oft roar,
Will a Gloucestershire Town, by combining, explore.

Campan

XI. REBUS 284, by Mr. Turner.

JOIN what Distance implies to the Mark of a Bride,
And the Spaniard's proud Title united beside;
You'll soon see a Town's Name, in Berkshire, appear,
And where I began first to draw the fresh Air.

XII. REBUS 285, by Mr. Turner.

THE Reverse of a Pagan, and Dread of a Child,
Is the Name of a Fair, that my Heart has beguil'd.

K

XIII.

THE BRITISH PALLADIUM, &c

XIII. REXUS 286, by Mr. Robert Tyrrell Heath.

TO the first of Mankind,

Add the Active of fold;

Then, what pleases, you'll find,

Both the young and the old.

XIV. REXUS 287, by the same Correspondent.

A Wave of the Sea, when it lashes the Shore,
And reverse of an off, will an Artist explore.

Or thus.

FROM a Fish of the Sea, that eight Letters contains,
Strike one Letter off, and a Man then remains.

XV. REXUS 288, by Clericus, a Subscriber.

THE first of a Villain, and last of a Neck,
Is the Name of your Friend, without Blemish or Speck,
That no Honour can shame,* and no Modesty check.

* His Virtues being irreproachable.

Neck

NEW PARADOXES.

I. PARADOX, by Mr. Thomas Smith, of Lamberhurst, Kent.

FOUR Trees you may plant, that their Distance shall be
Twelve Feet from each other, from Tree unto Tree.Four more you may plant, opposite two and two,
Like Distances, yet double Distance, will shew.

II. PARADOX, by Mr. Swift, of Stow, near Lincoln.

FROM a Month's second Day, when in Prison I lay,
I neither ate, drank, till the next 14th Day;
Not all that Time sleeping, nor hungry, nor dry,
Could Others go through such a Task as did I?

III. PARADOX, by Mr. Swift, of Stow.

THOUGH strange, 'tis true, and will appear,
At Stow 'tis Summer all the Year;
In neighb'ring Towns, we all allow,
Last Year were seen both Frost and Snow;
The Winter wet, the Summer cold:
The Wonder, pray, next Year, unfold.

IV. PARADOX, by Miss Polly Stow.

A Man was robb'd, old Stile, as some Folks say,
Upon no Day o'the Month, nor Night nor Day,

V. PARADOX, by Juvenis, addressed to Miss Polly Stow.

AN Ell length of Cloth, of a Yard and Half broad,
Is a Yard $\frac{3}{4}$ ths square, as you may define it;
Yet a Piece, of like Breadth, may be found will accord
With two Ells and a Half long, exactly, to line it.

VI. PARADOX, by Amelia.

WHEN God Almighty had his Palace fram'd,
The glorious shining Structure Heav'n he nam'd;
And, when the first rebellious Angels fell,
He doom'd them to a destin'd Place, call'd Hell.
There's Heav'n and Hell confirm'd by sacred Story,
But I could never read of Purgatory;
That cleansing Place, which, of late Years, was found
For sinning Souls to sleep in till they're sound.
The Priests contriv'd it for the Roman Race,
Our Maker never thought of such a Place.

O Rome!

O Rome! we own thee for a learn'd, wise, Nation,
To form a Place for Priests, no where * in God's Creation! }
As thou hast form'd a bleis'd Transubstantiation!

* *Quere, the Situation of the Place of Purgatory? and by what Infallibility of magical Operation Bread and Wine are immediately changed into real Flesh and Blood?*

NEW QUESTIONS.

I. QUESTION 633, by Mr. John Abbot, at Mr. Cole's, Mathematical Instrument Maker, Fleet-Street, London.

A Shepherd can fold 500 Sheep with 100 Hurdles, each Hurdle being 4 Feet broad, and 6 Feet long; required how he may fold 1000 Sheep, with 2 Hurdles more, of the same Size?

II. QUESTION 634, by Mr. Ralph Dutton, of Northwich, Cheshire.

A Vintner has the Bottom of a Cask of Wine, in Quantity 20 Gallons, the Height of the Cask = 50 Inches, Staves exactly circular, and Difference between the Bung and Head Diameters = 6 Inches. When the Cask is leaned on its Side, so that the Wine just touches the lower Edge of the Cask, you may just discern the upper Edge of the Bottom: Required the Content of that Cask in Wine Gallons? Or the Length of the Cask, and Difference of Head and Bung Diameters being the same as above, what Quantity of Wine must the Bottom of the Cask hold, to touch the lower Edge and upper Part of the Bottom, when the Cask is leaned on its Side, as before, holding the most Wine possible? And what are the Cask's Dimensions?

III. QUESTION 635, by Geometricus.

REQUIRED the respective Angles of a quadrangular Field, whose Sides are 15, 18, 21, and 24 Poles, and its Area = 2 Acres.

N. B. To inclose the greatest Area with four or more Lines has been repeatedly shewn, in the *Lady's Diary*, and other annual Publications, and lately in the *Palladium*; yet Mr. Dutton requires the greatest Area the above four Sides will inclose. The Surveyor of Timber, as it grows, may consider it.

IV. QUESTION 636, by Mr. John Thomas.

THE Length of the Roof of a House = 30 Feet, the Breadth thereof at Bottom, or upper Floor, 24 Feet, and its Inclination with the Horizon 45° : Required, from thence, the Dimensions of the greatest rectangular Apartment that can be formed under that Roof.

V. QUESTION 637, by Mr. Ralph Dutton.

REQUIRED the Direction of a Force capable of oversetting the Monument, near London-Bridge, with the least Stroke possible, so as to be made thereby to fall down, like a Tree, cut off at the Bottom with an Axe.

VI. QUESTION 638, by Mr. Richard Sanders, of Cottingham, near Hull.

A Servant went late to Market, and bought Woodcocks at a Shilling a Piece, Partridges at Eight-pence, Snipes at Sixpence, Quails at Four-pence, Larks at Two-pence, and Sparrows at one Penny, each: Twelve Shillings were laid out, and the Product of the Number of Birds bought was the greatest. Required the Number of each.

VII. QUESTION 639, by Mr. Thomas Smith, of Lamberhurst, Kent.

THERE is a Piece of Land in the Form of a right-angled Triangle, whose Base = 40 Chains, and the Sum of the Perpendicular and Hypothenuse = 90 Chains: Required, from thence, the two Legs, separately, and Area; by the shortest and easiest Method possible.

VIII. QUESTION 640, by Mr. Robert Wilkinson, at Mr. Clarke's School, at Newton, near Alnwick, Northumberland.

THERE are three Towers, A, B, and C, whose Distances from a fourth Tower, D, are as follow:

From D to $\left\{ \begin{array}{l} A = 1280 \text{ Feet.} \\ B = 3200 \text{ Feet.} \\ C = 1440 \text{ Feet.} \end{array} \right\}$ Standing at the Base of the Tower D, I heard the Report of 3 Guns, fired successively, from the Tops of the 3 Towers, A, B, and

and C, which reached my Ear in the Times of 1.143, 2.846, and 1.2672, Seconds, respectively, after firing; and the Square of the Height of the Tower D is equal to the Product of the Heights of the Towers A and C. Required the Heights of the 4 Towers, A, B, C, and D.

IX. QUESTION 641, *by the same Correspondent.*

$$\text{Given } \left\{ \begin{array}{l} x^2 y^3 - xy^2 = 15728640 = a. \\ \frac{y}{x} + 6y^2 - \sqrt{y} = 393216 = b. \end{array} \right\} \text{ Required } x \text{ and } y.$$

X. QUESTION 642, *by the same Correspondent.*

IN a right-angled Triangle, ABC, given the Base AB = 40, and the Angle at the Base BAC = 30°; to determine, from thence, the Length of the Perpendicular, BC, to subtend an Angle of 14°, and to give a geometrical Construction

XI. QUESTION 643, *by Mr. William Burke, of Swanland.*

THE Opening of the Lock-Doors, at Hull, is 40 Feet wide, and 21 Feet high: Required the Weight of Water these Doors will sustain, when the Lock is full, and no Water on the other Side, next the River.

XII. QUESTION 644, *by Mr. J. Gruby, at Coventry, Warwickshire.*

THERE is a Cylinder, whose Diameter is x^{2x} , its Altitude, x^{3x} , its Solidity, 7.4467555 solid Feet: Required, from thence, the Diameter and Altitude of the said Cylinder.

XIII. QUESTION 645, *by Mr. Robinson, of Bidick.*

THE Radius of a Quadrant of a Circle is equal to 24 Inches: Required the Diameter of the greatest Semicircle that can be inscribed therein; and also the Dimensions of the greatest Ellipsis that can be inscribed in that Semicircle.

XIV. QUESTION 646, *by Mr. Marsden, of Netherhuist.*

THREE different Seconds, in Music harmonic, Are frequently found in Degrees diatonic; The Method how each of these Seconds is found, And also their Ratio, be pleas'd to expound.

XV. QUESTION 647, *by Sir Gregory Gildbrabs, of Derby.*

ON the 25th of May, 1777, Latitude 10° N. the Sun's Amplitude from the North, at Rising, was taken 21° 48' 32", and his greatest Azimuth from the North, on the same Day, was observed to be 71° 21' 12". Required, from thence, the Variation of the Needle.

XVI. QUESTION 648, *by Mr. Joseph Mouldsall.*

A Maypole stands on a horizontal Plane, whose Height to the Garlands was 45 Feet, from thence to the Top 20 Feet; now the perspective Angle of the Top Part, viz. from the Garlands, was observed by the Eye of a Spectator (5 Feet high) to be a Maximum: At what Distance was the Observer from the Foot of the Maypole? And to give a geometrical Construction.

XVII. Practical Navigation QUES. 649, *by Mr. Sherwin, of Ashton-upon-Trent,*

BEING at Sea, in North Latitude, in 1777, (Clouds having hindered us from taking the Sun's Meridian Altitude,) we observed his Altitude, in the Afternoon, to be 61° 4', and his Azimuth, from the North, 165° 11'; some Time after we observed his Altitude to be 39° 12', and his Azimuth from the North 124° 6': From whence are required the Latitude, Day of the Month, and Time of the Day, when these Observations were made, by a simple Equation.

XVIII. QUESTION 650, *by Mr. T. Barrow, of Welton School, near Hull.*

The Transverse and conjugate Diameters of an Ellipsis are 60 and 40, respectively: Required, from thence, the Diameter of a Circle, whose Center shall be at One of the Extremities of the Conjugate, and its Periphery shall cut the Ellipsis into two equal Parts.

XIX.

XIX. QUESTION 651, a Domino Alexandro Rowe.

DATUM Latus Quadratii inscripti recto-angulo Triangulo: Requiri Dimensiones, cum Area Maximum est?

XX. QUESTION 652, by Mr. Rowe.

Given $\begin{cases} x^4 - y^4 = 16386591. \\ x^4 \sqrt{y} - y^4 \sqrt{x} = 80761080. \end{cases}$ } Required the Values of x and y .

XXI. QUESTION 653, by Mr. Sanders, of Cottingham.

Given $\begin{cases} x^3y + x^2y^3 = m = 460992. \\ y^4 - x^2 = ny^2x, (n = 62.9841206.) \end{cases}$ } Required the Values of x and y , by a quadratic Equation.

XXII. QUESTION 654, by Mr. John Cartill, of Walkinton, Yorkshire.

GIVEN the Chord 20, and versed Sine 6, of a Circle's Segment, to find the Area and Arch thereof in Degrees, Minutes, and Seconds; and also the Circle's Diameter.

N. B. This Question was over limited by Area, Cord, and versed Sine, given by Mr. Sanders, of Cottingham, and therefore rendered impossible to answer.

XXIII. QUESTION 655, by Juvenis.

REQUIRED the Year, N. S. next ensuing, when the Golden Number will be 19, Epact 18, Number of Direction 12, Sun's Cycle 4, and Roman Indiction 12.

XXIV. QUESTION 656, by Mr. Isaac Gumley, of Countesthorpe.

A and B had between them the Sum of 3080*l*. which they spent in the following Manner: *Viz.* A spent 1*l*. the first Week, 2*l*. the second, 3*l*. the third Week, &c. increasing 1*l*. each Week; and B spent, every Week, the Cube of what A did; *viz.* 1*l*. the first Week, 8*l*. the second, 27*l*. the third, &c. How long did the Money last them, and what Sum did each Person spend?

XXV. QUES. 657, by Juvenis, of Portsmouth.—For a Turnpike-Keeper to answer.

HOW much must a Turnpike, with twenty-five Commissioners, or Proprietors, belonging thereto, bring in yearly, clear of Deductions, except the Turnpike-Keeper's Salary of 30*l*. a Year to pay out of it, so that the Turnpike-Keeper may put as much into his own Pocket, annually, as will lessen each Commissioner's first annual Share exactly the eighth Part; and, that thirty Times each Commissioner's last annual Share shall be exactly equal to the Turnpike's whole yearly Income, wanting twenty Pounds. Required the Turnpike-Keeper's annual Gain? And each Commissioner's yearly Income, with the Whole Income of the Turnpike, per Week.

To the PALLADIUM-AUTHOR.

Sir,

THE Science of Sounds has not been beneath the Notice of Sir Isaac Newton, in his *Principia*, Muchenbroek, Mr. Emerson, and other great Philosophers and Mathematicians of all Nations. The Power of Harmony is wonderful, if we believe our great Poets, *Shakespeare*, *Congreve*, *Rowe*, *Mitchel*, *Dryden*, *Cowley*, *Pope*, and Others. *Dryden*, in his incomparable Ode to *Cicilia*, speaking of *Timotheus*, says, "He could swell the Soul to Rage, and kindle "soft Desire." And Mr. *Pope* tells us, that by *Timotheus*' Lays, "The "World's great Victor stood subdu'd by Sound." Wherefore, to promote this amazing Science of Music, the following harmonical Question is proposed by a Well-wisher to the *Palladium*.

GEORGE EYRE.

Castleton, Derbyshire.

Whoever sends the best Answer to the following Question, before the Beginning of April, 1779, will be intitled to the Reward of 12 Prize Palladiums.

PRIZE-QUESTION, by the above Author.

AS I walk'd out one Summer's Night, the Ev'ning calm and clear,
The Sound of some melodious Pipe I felt salute my Ear;

By

By Trial of my Concert Flute, I found its Pitch to be
 An Octave (neither more nor less) above the Cliff of C.
 Now let's suppose, that wat'ry Waves asunder are four Feet,
 And, whilst a Wave is running through that Length, in Feet complete,
 So long the Sound of this same Pipe was coming to my Ear;
 How long's the Pipe, and how far off, skill'd Artists, pray declare?

Mr. Stephen Hartley, of Sowerby-Bridge, in a Letter that came too late, (past the Middle of July, though dated May 28,) answered most of the Questions. — Mr. Thomas Nield, of Chester, writing August 7, 1778, answering 1, 2, 3, 6, 8, 10, Questions, were too late for Notice. — Why will Correspondents, writing too late, lose all their Time and Labour?

PRIZES WON. Mr. Isaac Gumley, of Countesthorpe, Leicestershire, claims 5 Prize-Ænigma Palladiums, covered with embossed Paper; Mr. W. Turner, of Witney, Oxfordshire, 4 Prize-Ænigma Palladiums, and 2 Merit-Palladiums for resolving Quæres; Mr. W. Swift, of Stow, near Lincoln, 2 Merit-Palladiums; Mr. R. Marjib, at Horsey, near Lancashire, 2 Merit-Palladiums; Mr. R. Judson, of Beverley, Yorkshire, 2 Merit-Palladiums, for his Improvements in Pag. 63 and 64, Pal. 1779; *Magnesia*, of Bath, 4; *Δελτοειδης*, of Dublin, 3; *Πυλαδες*, of Chester, 4; *Ορεστις*, of Ditto, 3; Merit-Palladiums. — *Numericus*, of Norwich, 3 Merit-Palladiums; *Geographicus*, of Oxford, 3; *Clericus*, of Cambridge, 2; *Zodiacus*, of York, 3; *Analyticus*, 2; *Fidelis*, 2; *Lucinda*, 2; *Amanda*, 3; Miss Maxfield, 2; all of London. — Who are desired to send their respective Orders for them, in their own Hand-writing, to Mr. Cole's, near the Globe-Tavern, Fleet-Street, London

A TABLE, shewing the No of Direction, N. S. at Sight, fr. 1700 to 1899. For the finding the Fall of Easter, in that Style.

Col. No	A	B	C	D	E	F	G
1	26	27	28	29	30	31	25
2	19	13	14	15	16	17	18
3	5	6	7	8	2	3	4
4	26	2	21	22	23	24	25
5	12	13	14	15	16	10	11
6	33	34	35	29	30	31	32
7	19	20	21	22	23	24	18
8	12	13	7	8	9	10	11
9	26	27	28	29	30	31	12
10	19	20	21	15	16	17	18
11	5	6	7	8	9	10	4
12	26	27	28	29	23	24	25
13	12	13	14	15	16	17	18
14	5	6	7	8	2	3	4
15	26	20	21	22	23	24	25
16	12	13	14	15	9	10	11
17	33	34	28	29	30	31	32
18	19	20	21	22	23	17	18
19	12	13	6	7	8	9	10

A TABLE, shewing the No of Direction, O. S. For finding the Fall of Easter, in that Style.

Col. No	A	B	C	D	E	F	G
1	19	20	21	22	16	17	18
2	5	6	7	8	9	10	11
3	26	27	28	29	30	24	25
4	10	13	14	15	16	17	18
5	5	6	7	8	2	3	4
6	26	27	21	22	23	24	25
7	12	13	14	15	16	10	11
8	33	34	35	20	21	22	23
9	19	20	21	22	23	24	18
10	12	13	7	8	9	10	11
11	26	27	28	29	30	31	32
12	19	20	21	15	16	17	18
13	5	6	7	8	9	10	4
14	26	27	28	29	23	24	25
15	12	13	14	15	16	17	18
16	5	6	7	2	3	4	
17	26	20	21	22	23	24	25
18	12	13	14	15	9	10	11
19	33	34	28	29	30	31	32

N. B. This Table serves to answer Part of the IVth Quære, 266, Palladium, 1778; the other Part is answered by an Epact and Indiction Table.

Any Number, doubted, is known, by Succession, in this and the following Table.

A TABLE

A TABLE, shewing the *Movable Feasts*, at Sight, according to New or old Stile, from 1700 to 1899. By the *Number of Direction* in either Stile.

No of Direc'n.	Sund. at Epiph.	Septuagesima Sunday.	Quinquagesima Sunday.	First Day in Lent.	Midlent Sunday.	EASTER SUN. DAY.	Rogat. Sunday.	Ascension Day.	Whit Sunday.	Trinity Sunday.	Sun. aft. Trinity.	Advent Sunday.
1	1	Jy 18	Fe. 1	Fe. 4	M. 1	M 22	A. 26	A. 30	M 1	M 17	27	N 29
2	1	19	2	5	2	23	27	M. 1	11	18	27	30
3	1	20	3	6	3	24	28	2	12	19	27	De. 1
4	2	21	4	7	4	25	29	3	13	20	27	2
5	2	22	5	8	5	26	30	4	14	21	27	3
6	2	23	6	9	6	27	M. 1	5	15	22	26	N 27
7	2	24	7	10	7	28	2	6	16	23	26	28
8	2	25	8	11	8	29	3	7	17	24	26	29
9	2	26	9	12	9	30	4	8	18	25	26	30
10	2	27	10	13	10	31	5	9	19	26	26	De. 1
11	3	28	11	14	11	Ap. 1	6	10	20	27	26	2
12	3	29	12	15	12	2	7	11	21	28	26	3
13	3	30	13	16	13	3	8	12	22	29	25	N 27
14	3	31	14	17	14	4	9	13	23	30	25	28
15	3	Fe. 1	15	18	15	5	10	14	24	31	25	29
16	3	2	16	19	16	6	11	15	25	Je. 1	25	30
17	3	3	17	20	17	7	12	16	26	2	25	De. 1
18	4	4	18	21	18	8	13	17	27	3	25	2
19	4	5	19	22	19	9	14	18	28	4	25	3
20	4	6	20	23	20	10	15	19	29	5	24	N 27
21	4	7	21	24	21	11	16	20	30	6	24	28
22	4	8	22	25	22	12	17	21	31	7	24	29
23	4	9	23	26	23	13	18	22	Je. 1	8	24	30
24	4	10	24	27	24	14	19	23	2	9	24	De. 1
25	5	11	25	28	25	15	20	24	3	10	24	2
26	5	12	26	M. 1	26	16	21	25	4	11	24	3
27	5	13	27	2	27	17	22	26	5	12	23	N 27
28	5	14	28	3	28	18	23	27	6	13	23	28
29	5	15	M. 1	4	29	19	24	28	7	14	23	29
30	5	16	2	5	30	20	25	29	8	15	23	30
31	5	17	3	6	31	21	26	30	9	16	23	De. 1
32	6	18	4	7	Ap. 1	22	27	31	10	17	23	2
33	6	19	5	8	2	23	28	Je. 1	11	18	23	3
34	6	20	6	9	3	24	29	2	12	19	22	N 27
35	6	21	7	10	4	25	30	3	13	20	22	28

A TABLE, shewing the *Movable Terms*, in both Stiles.

EASTER TERM		TRINITY TERM	
beg.	ends.	beg.	ends.
Ap. 8	M. 4	M 22	Je 10
9	5	23	11
10	6	24	12
11	7	25	13
12	8	26	14
13	9	27	15
14	10	28	16
15	11	29	17
16	12	30	18
17	13	31	19
18	14	Je. 1	20
19	15	2	21
20	16	3	22
21	17	4	23
22	18	5	24
23	19	6	25
24	20	7	26
25	21	8	27
26	22	9	28
27	23	10	29
28	24	11	30
29	25	12	Je. 1
30	26	13	2
31	27	14	3
2	28	15	4
3	29	16	5
4	30	17	6
5	31	18	7
6	Je. 1	19	8
7	2	20	9
8	3	21	10
9	4	22	11
10	5	23	12
11	6	24	13
12	7	25	14

N. B. Jy. stands for *January*, Fe. for *February*, M. for *March*, Ap. for *April*, M. for *May*, Je. for *June*, Ju. for *July*, N. for *November*, De. for *December*.

The

The *honorary Palladium Button*, to be worn on the Hat, or on Suits of Clothes, on public or private Occasions, as shall be approved by the *honorary Members*, is exhibited in the following Representation.

A. A. A. *Armorum &
Artium Amator.*

Utriusque Minervæ.



A Lover of Arts and Arms.

Learning and Prowess.

FIGURE. — Pallas, or Minerva, Goddess of Arts and Arms.

* * The List of the *Palladium Society* is too large for Admission into any *Palladium*; which must therefore be deferred to an *Appendix*, as must the Rest of the Catalogue of the Articles in each Year's *Palladium*. *Palladium Members* are respectively required to send their real Names and Places of Abode, to the *Palladium-Author*, or his *Secretary*, with the Subscription-Money, for not less than six *Palladiums*, to Mr. Cole's, next the Globe, Fleet-Street, for *Palladiums*, 1779, at 1s. 3d. each, and for *Palladium Buttons*, at 9d. each, to be worn on their Hats, or Clothes, as usual.

The DULCE DOMUM, inserted in last Year's *Palladium*, sung, in Procession, by the Master, Chaplains, Organist, Choristers, and Scholars of Winchester School, or College, the Eve preceding Whitsuntide, translated, as follows, by Mr. Robert Tyrrell Heath, educated in the royal Seminary of Christ's Hospital, London: Being between 14 and 15 Years of Age.

SWEET HOME.

1. LET us sing together, O School-fellows; oh! why are we silent? Let us sing a noble Canticle, let us sing sweet Melody of our Home; let us resound sweet Home!

CHORUS. *Let us resound sweet Home!*

2. Lo! draws nigh the happy Hour of our Joys; after tedious and weary Times comes the wished-for Goal of our Labours.

3. O my Muse! lay aside Books, be weary of them; lay aside hard Lessons, lay aside Business; now leisure Time is come, let my Cares leave me!

4. The Year smiles, the Meadows smile, and let us smile also! now *Daulias*, the Visitor, returns Home again; O School-fellows, let us repair to ours!

5. Hah, Roger, bring the Horses; ah! now let us go; and, with Pleasure, seek the dear Door and Kisses of our Mother!

6. Let us sing to the Household Gods, and may our Voices be heard: O *Phosphorus*! what dull Sun-Beam delays our Joy?

R. T. H.

July 21, 1778.

The Expence of Printing being increased on Account of the *Geography* added, the *Palladiums* cannot, at present, be sold singly under 1s. 6d. nor under 15s. by the Dozen, to repay the great Expence of printing and publishing; as Mr. Bew, the Bookseller, of *Pater-noster Row*, can certify.

ERRATA. — Page 65, Line 33, for *Saturday*, read *Sunday*.
Page 72, Line 9, fr. Bot. for *Property*, r. *Propriety*.

THE END.



